HOW WOMEN FACULTY MEMBERS IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS FIELDS EXPERIENCE THE PROMOTION, TENURE, AND REAPPOINTMENT PROCESS WITH RESPECT TO THEIR SERVICE WORK

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Abstract

Males have long led colleges and universities. As gendered organizations, academia has taken on traditions and expectations from the male viewpoint. Research has shown that female faculty members are not being promoted through the ranks as quickly or as often as their male counterparts. The purpose of this Interpretative Phenomenological Analysis (IPA) is to understand how women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion, tenure and reappointment process with respect to their service work. The main question the researcher sought to answer was: How do female faculty in STEM fields experience the promotion, tenure, and reappointment process with respect to their service work? Data was collected through interviews with four women faculty in STEM fields who had experience with the promotion, tenure, and reappointment process at Lehigh University. Results indicated that female faculty members in STEM fields at the rank of associate professor feel significant service burden that takes time away from their research, which in turn, has a negative impact on their promotability. These same feel the promotion, tenure, and reappointment process is harder for them as women as compared to their male counterparts. This research demonstrates that research institutions need to adjust current practices to help ease female faculty members’ service burden and/or to adjust what is valued during the promotion, tenure, and reappointment process.

Keywords: faculty, research institution, service work, female faculty, promotion, gender equity
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Chapter One: Introduction

The purpose of this Interpretative Phenomenological Analysis (IPA) is to understand how women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion, tenure and reappointment process with respect to their service work. At this stage in the research, service activities are generally categorized into three groupings: service to the institution (internal), service to the community (external), and service to one’s discipline (Neumann & Terosky, 2007). Knowledge generated from this study is expected to inform college and university leaders of the unconscious bias that may be occurring on campus impacting female faculty members in STEM fields from achieving tenure and/or full professor as well as put into practice some support systems for female faculty members to assist them on their professional journeys.

Statement of the Problem

Research has shown that female faculty members are not being promoted through the ranks as quickly or as often as their male counterparts. According to Misra, Lundquist, Holmes, & Agiomavritis (2011), male faculty members tend to focus more on research and female faculty members put more effort towards internal service work. Since service work is difficult to measure and is not as highly valued by promotion and tenure committees, women are not earning promotions at the same rate as men.

Males have long led colleges and universities. As gendered organizations, academia has taken on traditions and expectations from the male viewpoint (Ford, 2016; Misra, Lundquist, & Templer, 2012; O'Meara, 2016; Pyke, 2014). Gendered organizations are those that reflect a more conventional organizational structure, policies, and cultural presuppositions benefitting male faculty members’ careers and adversely affecting those of the female faculty members.
Traditionally, men have had the responsibility of being the primary breadwinner while women have been the caretakers of the family. Colleges and universities, overall, have not completely moved away from this model. Even though there are more women faculty members than ever in academia, women are disproportionately less likely to earn the same rank and promotions as their male counterparts in the same cohort (Misra et al., 2012). At Research Level 1 institutions, women represent 10.9% of assistant professors, yet only 7.2% of full professors even though there are qualified female candidates who could earn this highest rank (Monroe & Chiu, 2010). Research has shown that women, especially in the STEM areas, are disadvantaged in academia due to stereotyping. This results in women not earning the same recognition, pay, and promotions as their male counterparts (Hirshfield & Joseph, 2012; Kaatz & Carnes, 2014).

The percentage of female faculty members decreases as faculty rank increases (Pyke, 2011). In the United States, men hold 75% of the full professorships while women only account for 25% of the full professorships (Misra et al., 2011). One explanation for this may be the fact that male faculty members spend more of their time on research activities while women faculty members spend more of their time performing service activities (Misra et al., 2011). Service work is not valued as highly as research, nor is it as easily measured; therefore, women are not being promoted through the ranks as quickly or as often as their male counterparts.

Misra et al. (2011), did a study on 350 faculty members at the University of Massachusetts. They found that 75% of female associate professors took on major service roles while only 50% of their male counterparts did the same. It was found that the women who did these major service roles took an average of twelve years to earn full professor after earning tenure as compared to the usual seven years.
As there are fewer female faculty members in the higher ranks, there is more pressure for
the few to serve on more University committees to keep gender equity on these committees
(Pyke, 2011). Men have the ability to turn down the request, as there are others who can take
their place; women are not afforded this luxury since there are fewer of them to bear the
workload.

Ford (2016) states that colleges and universities are gendered environments where
masculine traits are favored. In order to break this cycle of disproportionately of more men in
leadership positions than women in colleges and universities, Ford recommends three areas of
focus: development of self-efficacy of female faculty members, social modeling, and mentoring.
O’Meara (2016) also supports this in citing that gendered organizational theory suggests that
leaning towards service work is not biological, but is socially constructed.

Institutions of Higher Education not only need to review their recruiting and hiring
practices of female faculty members, but they also need make concerted efforts to retain these
women and help them earn tenure, full professor, and other leadership positions on campus.
Female faculty members need to be conscious of the fact that they may be asked to serve more
on institutional committees and they need to take charge of their own career. Women faculty
members need to be more selective in how they spend their time on valuable tasks that will help
them achieve tenure and full professorship. Department chairs and deans should be more aware
of how institutional service work is distributed among their faculty and actively work on
strategies to equally distribute the types of work that are considered less valuable towards
promotion, tenure, and reappointment. Another question institutions may ask themselves is why
is internal service work not valued as highly as external service work?
Significance of the Research Question

Add to scholarly research

According to O’Meara (2016), there is not as much research on service work as there is for the other two areas of faculty life, teaching and research. This study would add more information to the repository of faculty service activities in general. Also, a research study on this topic would add to the research specifically of women faculty members and bring attention to the issues women face in academia with respect to their gender.

Helps improve practice

Research has shown that service work to the institution not easily or consistently measured and is undervalued. Methods by which this type of work can be documented consistently are needed, especially in faculty dossiers that are reviewed for promotion, tenure, and reappointment purposes.

Bringing more attention to the issue will hopefully encourage institutions of higher education to assign more value to service activities. A concentrated focus on valuing service may encourage more male faculty members to participate and ultimately better the university community overall.

Women tend to be asked to do a higher percentage of service work as compared to their male colleagues, as there are fewer women to balance the scales with respect to gender on committees. Pyke (2011) suggests inviting men who are committed to gender equity to serve in their place at times. This will allow the women faculty members more time to spend on their research and therefore providing them a better chance to attain tenure and promotion.
Helps improve policy

Service work, both internal to the institution as well as external to the community, tends to be undervalued. As women are doing more of this type of service work, the work they are doing is less valued. Institutions should consider defining clear parameters for faculty members to achieve full professor akin to what is defined for tenure (Misra et al., 2011). Institutions should also consider whether going above and beyond in service would constitute extra pay. The pipelines for men and women doctorates in STEM fields are about equal, yet there are still significantly fewer women than men full professors. This research could identify some changes that could be made to policy and practice to improve the gender diversity of the professorate and therefore improve the organization and its outputs.

Diversity increases innovation

Research has shown that diversity on campus and in working groups fosters more ingenuity and creativity in problem solving, yet there is still gender inequity on our college campuses. Another important factor to consider is that student demographics on college campuses are changing, and it would be beneficial to those students to see these changes in the professorate as well (Sgoutas-Emch, Baird, Myers, Camacho, & Lord, 2016). Research has also shown that diversity in the classroom has fostered innovation, increased problem solving, enriched learning and students graduate at higher rates (as cited by Tienda, 2013). These same outcomes would benefit faculty in terms of their research. “Innovation within an institution is manifested primarily by the faculty” (Gialamas, Pelonis, & Cherif, 2013, p. 76). If there were more female faculty in STEM fields in an institution, the teams on faculty research could have more gender equity which would then provide more perspectives and increase innovation and more creative problem solving. This could then give the institution a more competitive
advantage to attract a higher caliber of student but also in terms of research funding and reputation.

Research Problem and Research Question

Higher educational institutions are gendered organizations that don’t value the types and amount of service work done by women, affecting women faculty members in STEM fields by impacting their ability to earn promotion and tenure. This leads to as the following question: How do female faculty in STEM fields experience the promotion, tenure, and reappointment process with respect to their service work?

My area of research interest lies in the realm of female faculty members not being promoted through the ranks as quickly or as often as their male counterparts. According to Misra et al. (2011), male faculty members tend to focus more on research and female faculty members put more effort towards service work. Since service work is difficult to measure and is not as highly valued by promotion, tenure, and reappointment committees, women are not earning promotions at the same rate as men. This is an issue in that there needs to be diversity in faculty at all levels and in all subject areas; there is a bigger concern for the lack of gender equity in the STEM fields.

The methodological approach for this research is interpretative phenomenological analysis (IPA). The research will take place at Lehigh University, a higher research activity doctoral university located in the northeastern United States (The Carnegie Classification of Institutions of Higher Education, n.d.). IPA has roots in phenomenology, hermeneutics, and idiography. Phenomenology is the study of the lived experience. This lived experience of the research participant is interpreted through the researcher, and therefore, is hermeneutic. Lastly, IPA is considered idiographic in the fact that each semi-structured interview with each research
participant is analyzed individually and then across all participants, making sense of the lived experiences overall, but how that overall results impact each individual (Smith, 2011).

The following section of this chapter will include a description and discussion of Social Identity Theory, and in particular, in-groups and out-groups, which will serve as the theoretical lens for this study.

**Theoretical Framework**

**Social Identity Theory**

Workplaces can be viewed as a set of various workgroups organized in some specific way, and is easily visualized by the use of an organizational chart. Within a university setting, academic departments are clearly separate groups within a college, perhaps within a stem, and then within the university. Some academic departments, in particular the STEM fields, have a disproportionate ratio of male to female faculty members where the number of men significantly outweigh the number of women. Henri Tajfel’s Social Identity Theory provides a means to study how the members of a group identify themselves as a member of that group, and the impacts of being identified as a part of the in-group or out-group within the whole group. In this research study, the in-group is the set of male faculty members within a STEM department, while the out-group is the set of female faculty members within that same STEM department, where the number of male faculty members greatly outweighs the number of female faculty members.

In the late 1960’s to early 1970’s there was a change in how social psychologists viewed historical events such as the Holocaust. Prior to this time, the thoughts about ‘groups’ were simply the same thoughts about the ‘individual’ in summation (Hornsey, 2008). Rothbart, Fulero, Jensen, Howard, & Birrell (1978) performed studies that focused on how people make judgments of the whole group based upon impressions of a few members of that group. These
findings are in support of the definition of ‘stereotype’. Stallybrass’s (1977) definition of a stereotype as “a over-simplified mental image of (usually) some category of a person, institution or event, which is shared, in essential features, by large numbers of people… Stereotypes are commonly, but not necessarily accompanied by prejudice, i.e. by a favorable or unfavorable predisposition toward any member of the category in question” (as cited by Tajfel, 1982, p. 3)

The idea that a group is equal to the sum of its part was criticized, as it did not take into consideration any context such as culture or history and ultimately became the social identity approach. The theory and research in this area moved from the individual to more intergroup behavior. Tajfel and Wilkes (1963) performed studies and drew conclusions that when people classify each other into categories, there is an increase in the judgments made upon that classification. The results of Tajfel’s and his colleagues studies’ show that preferentialism for those in the in-group, while discriminating against the out-group (Taylor, Fiske, Etcoff, & Ruderman, 1978).

Tajfel and Turner (1979) discuss the range from interpersonal to intergroup characteristics where the former is solely focused on the individual person and not their group affiliations, while the latter is purely focused on the group and not on the individual. The authors then explain that members of the in-group tend to have a uniform behavior towards members of the out-group, and the in-group tends to treat all individuals of the out-group the same. This brings us to Social Identity Theory, which is based upon an individual defining their self-concept as being derived from the social categories to which they belong (Hogg, Terry, & White, 1995; Hornsey, 2008).

Ashforth and Mael (1989) have applied the concepts of Social Identity Theory to organizations, which up to that point in time had not really been researched. Two conclusions
that came from their work are: 1) A newcomer to an organization could be thought of as looking for an identity and finding it by joining the organization and committing to it; 2) Individuals have many identities, some of which may contradict each other. The individual rationalizes these contradictions to themselves by compartmentalizing their identities, and allowing for double standards.

There have also been some practical applications of Social Identity Theory. Such as McNamara’s (1997) application of Social Identity Theory on non-English-speaking immigrant groups in Australia. In one of McNamara’s studies, he interviewed a native Hebrew-speaking Israeli family who emigrated to Melbourne, Australia, an English speaking and predominantly Christian city. This family was well aware of their being in the out-group while others in their new English speaking Christian community were in the in-group. This was more apparent when having to explain to their children why they would not get a Christmas tree. One significant statement made by McNamara is that one’s social identity depends upon the group they are in at that moment; one’s social identity is not static.

Chattopadhyay, Tluchowska, and George (2004) apply relational demography approach to employees in the workplace. Relational demography stems from both Social Identity Theory and Social Categorization Theory. This approach suggests that employees compare their own demographic identities, e.g. gender and race, with those of their working group. Depending on how closely or dissimilar the two are has a direct impact on the employee’s commitment, absenteeism, and more. Hogg et al. (1995) are similar in that they say members of a group may become “depersonalized” as the individual’s self may not be taken into consideration by others; the person is generalized into the characteristics of the group into which they fall. They go on to say each group categorization is made up of fuzzy sets of characteristics, or features, that
represent the group membership. The members of these groups, especially the in-groups, are motivated to maintain the behaviors of the in-group to retain their status of that in-group. This may have a negative effect on those in the out-group in that those in the in-group are not motivated to step out of the norms of their group to help those in the out-group.

**Criticism of Social Identity Theory**

At one point, the research in the area of social identity was focused upon ethnocentrism. Tajfel (1982) cites Sumer using this term along with in-groups and out-groups in 1906 with the concept of ‘universality.’ However, there were concerns in applying the results of these studies universally as much of the collected data for the studies came from Western societies. These studies were also focused upon children, and there was difficulty in replicating the results, which led to questioning the cognitive development of children and their understanding of in-group and out-groups. Even though this early research may have been questionable, there have been other research studies since this time that would support similar findings, the only difference being a more mature understanding of being able to apply findings universally.

Bornstein et al. (1983) question Tajfel’s methodology of computing results and their meanings, particularly with respect to between group discrimination. Bornstein et al. discuss the issue of an individual thinking the group to which they identify is superior and therefore having a higher positive self-esteem simply because it is their group. Another question that Bornstein et al. comment on with Tajfel’s theory is when gender comes into consideration. They state that even though Tajfel’s results are repeatable upon gender, Bornstein et al. wonder why this is so, considering women’s tendencies to care more about interpersonal relationships and men more concerned about tasks.
Why Social Identity Theory?

The academic stem of universities can be viewed as a set of concentric groups. The largest group is the university as a whole, the next set of groups could be the colleges, and so forth. The breakdown of each group into smaller groups does is not necessarily consistent across the departments or colleges.

Figure 1 is a visual that shows the possibility of how a university can be viewed as a set of groups. Within the College of Arts & Sciences, we can see there is a grouping of specific types of departments, Humanities versus Sciences. The departments can even be broken down into further groups. As an example, if you think about a Department of Civil Engineering, there may be groups within that department for those who study bridges as opposed to roads or water. In this study, academic departments in STEM fields with disproportionate numbers of male to female faculty member will be the considered the group, while the male faculty members will be considered the in-group, and the female faculty members will the considered the out-group.

![Figure 1 - University as a set of concentric groups](image-url)
Social Identity Theory applied to this study

Female faculty members in STEM fields are outnumbered in the higher faculty ranks. Tajfel’s Social Identity Theory is fitting for this research project as the male faculty members in STEM fields could be viewed as the in-group while the and women faculty members in STEM fields would be the out-group. Chattopadhyay et al. (2004) did something similar when they applied Social Identity Theory to an organization and specifically looked at the ramifications of employees who self-identify closely or dissimilarly to the remainder of their workgroup.

Social Identification Theory is based upon an individual’s concept of his or her own identity and how it relates to others within their social groups. Social Identity Theory also covers how others perceive an individual based upon their own categorization of the other person into different groups. The social groups could include their community, church, workplace, school, or any other group. People naturally categorize themselves as well as others, and then determine whether they are a part of the in-group or out-group for that specific setting. A person may be a member of an in-group in one situation, but a member of an out-group in another; one’s social identification is not static.

Along with these categorizations, people tend to apply stereotypes to those in the group that are in the other category from which they themselves identify. Institutions of higher education are gendered organizations. This means that those characteristics that are deemed ‘male’ are regarded more highly than those that are considered ‘female’. Women faculty members in STEM fields are still in the minority in their departments, and even more so at the highest faculty ranks. Men in leadership positions in these departments may still have a tendency to ask women to do more of the ‘housekeeping’ type work that may take time away from their
research and ultimately have a negative impact on the women’s professional progression. The requests of male department chairs and deans requesting women to do this type of work are stereotyping women into traditional roles.

Another area of focus could be how women faculty members in STEM fields who were successful in achieving the highest academic rank had to do in order to overcome any professional impacts do to their dissimilar identification with others in their department. Chattopadhyay et al. (2004) outlined some outcomes when this is the case, some of which are not positive for the workgroup or organization. Two other studies of interest are Wolman & Frank (1975) and Kanter (1977), both of which are early studies on women working in male dominated groups and the roles these women take.

Conclusion

Social Identity Theory deals with stereotyping, in-groups and out-groups from both an intergroup and organizational level, as well as the differing roles that women take when they are in the minority in their working groups. As institutions of higher education are gendered organizations, and STEM fields are still male dominated, how women fit into these male dominated groups, and how they are successful at reaching those goals, is important to study.

This study, and others like it, will help to enlighten many people throughout academia. This will help women on the tenure track, especially those in STEM fields where they are the minority, to be mindful of the natural tendencies to be considered a part of the out-group that may negatively affect them in their professional progression towards full professor. It will help male faculty members, department chairs, associate deans, deans, etc. to be aware as to what they may be subconsciously doing to undermine women in STEM fields from earning full professor.
Studies have shown that working groups that have diversity are more creative, productive, and successful, and this diversity includes having women.

Gender equity among faculty members at an institution of higher education should not only be viewed and calculated as a whole of the institution, but also at the college and department levels. This is especially important in the STEM fields where there is a disproportionate number of male faculty members compared to female faculty members. The next chapter of this paper will provide a literature review on the impacts of the traditionally male viewpoints and practices on female faculty members in STEM fields, particularly with respect to service work and their progression through rank.
Chapter Two: Literature Review

Institutions of higher education are gendered organizations (Misra et al., 2012). This means they take on the assumptions of the employees even, in the case of higher education, the white male, if it is not in perfect alignment with the true mission of the institution. There are more women in higher education today than ever before, yet there is a disproportionate representation of women faculty in the STEM fields, especially at the highest ranks (Curtis, 2013). Research has shown that diversity on campus and in working groups has fostered more ingenuity and creativity in problem solving, yet there is still gender inequity on our college campuses (Dezso & Ross, 2012; Richard, Kirby, & Chadwick, 2013). The demographics of the student population on college campuses are changing, and it would be beneficial for those students to see complementary changes in the professorate as well (Sgoutas-Emch et al., 2016). Colleges and universities should strive to have a more diverse faculty not only to mirror the more diverse student populations that are arriving on campus, but to also reach the institution’s pedagogical goals for their students benefit by providing a broader and richer educational experience rather than from a single viewpoint of that of the white male (Leggon, 2010; Tienda, 2013).

Service work is one of three areas of focus for faculty, the other two being research and teaching. Service work is not valued as much by administrators and faculty (as cited by Lawrence, Ott, & Bell, 2012). Since men are mostly in leadership positions, especially in the STEM fields, it can be concluded that men don’t value service work as much as teaching or research. Women tend to focus more and on different types of service work than their male colleagues (Vesterlund, Babcock, & Weingard, 2014). The fact that men are in leadership positions and do not value service work as much as they value teaching and research, and women
are doing more and different types of service work than their male counterparts, the result is that women faculty members academic careers are being negatively impacted. This gendering of service work should be brought more to the forefront as a concern for institutions.

The purpose of this literature review is to explore the gendering of faculty service work as well as strategic reasons as to why colleges and universities should be concerned about the lack of gender diversity among the STEM professorate. Questions that will attempt to be addressed in this literature review are: Is faculty service work gendered, and if so, how? What are the organizational benefits of having gender diversity among faculty members? Is there an impact on students when gender diversity among faculty members is lacking?

This chapter is divided into three distinct, yet related, themes of literature. The first theme is the gendering of faculty service work. Second, the organizational benefits of gender diversity will be discussed. Third, impact of gender diversity of the professoriate on students will be reviewed. The last section of this chapter will summarize the findings and identify some areas that would benefit from some further research.

The Gendering of Faculty Service Work

Since the 1940’s the tenure-track model has been the standard for academia (Gappa & Trice, 2009). The tenure-track model has members of faculty moving through three phases of professional development: assistant professor, associate professor (this may or may not include tenure), and ultimately to full professor. While navigating through their academic careers, faculty members have three areas of responsibility: research, teaching, and service (Mamiseishvili, Miller, & Lee, 2016).

It has been shown that service work, both internal and external, is not clearly defined at many institutions and while service work does not play a deciding factor in promotion, tenure,
and reappointment decisions mid-career faculty may be burdened by it. This burden can affect a faculty member’s ability to rise from Associate Professor to Full Professor. This can be especially harmful to female faculty members, as it has been shown that women tend to do more service work than men (Misra et al., 2012).

The History of Service

The Morrill Act of 1862, also known as the Land Grant Act, provided land to each state from the federal government in order to create colleges and universities to educate their residents. The Hatch Act of 1887 then followed with federal funding to assist the colleges and universities to educate the farmers and to expand the agricultural revolution. These two pieces of legislation added service to the mission of institutions of higher education (Boyer, 1990; Jaeger & Thornton, 2006). In the early 1900’s, the president of Harvard University announced that “democratic spirit of serviceableness” is at the root of colleges and universities in the United States of America (Boyer, 1990, p.5). There was opposition to the idea of higher education becoming more democratic and some even said the ideas of working with agriculture was moving away from the true mission of colleges and universities, and perhaps decreased their value (Boyer, 1990). However, as we know, service is still a part of the faculty responsibility more than 100 years later.

Service Work as Nebulous and Undervalued

Research, teaching, and service – are the three components of an academic’s life. Promotion, tenure, and reappointment processes heavily weigh research and teaching at most four year institutions. These same institutions also recognize the need for faculty members to also perform service work, it is “consistently underrated” (Boyer, 1990, p. 28). Are these elements ordered purposefully? Are they in order of importance? It has been said that service is
listed in the last position as the “real work” of institutions of higher education is to generate and impart new knowledge to their students (Hanson, 2007). If these were ordered by the amount of literature on each as its own topic, service work would certainly be last among the three as service is the most understudied (Neumann & Terosky, 2007). The entomology of the word service, as derived from Latin for slave (servus) and slavery (servitium) and suggests this might be the reason for the negative connotation for service among faculty (Hanson, 2007).

How is service work defined in terms of research, teaching, and service? The literature has shown that service can be categorized into three groupings: service to the institution (internal), service to the community (external), and service to one’s discipline (Neumann & Terosky, 2007). Unfortunately, not all service is valued equally. Even though one faculty member may spend more hours on service than another, it may be on service activities that are not as highly regarded, and my not serve them as well during promotion, tenure, and reappointment reviews. Some researchers have called service “nebulous” (Mamiseishvili et al., 2016, p. 274; Neumann & Terosky, 2007, p. 282), “difficult to define” (Lawrence et al., 2012, p. 325), and “ambiguous and insignificant” (Reybold & Corda, 2011, p. 121). One attempt at a definition of service is stated as a “catchall name for everything that is neither teaching, research, nor scholarship” (Blackburn & Lawrence 1995, p. 222). At many institutions, policies may exist stating faculty is rewarded for their service work, but in reality, service does not carry much weight in the promotion, tenure, and reappointment process (Jaeger & Thornton, 2006).

In their early stages of their careers, members of faculty have an idealistic view of their new career and how service will fit into their role (Reybold & Corda, 2011). At research institutions, new faculty may be protected from service work while being encouraged to focus on their research, as research carries more clout in promotion, tenure, and reappointment reviews. A
female participant in one study claimed that her institutional service responsibilities impacted her ability to keep up with her research which ultimately had a negative effect on her career. This participant just happens to be female, but it could be an issue for either gender (Neumann & Terosky, 2007).

Research has shown that associate and full professors spend more hours on service work than assistant professors (Misra et al., 2012), which is in support of statements that assert assistant professors may be shielded from having to perform too much service work (Neumann & Terosky, 2007). Mid-career faculty devote the most time, as compared to other faculty ranks, to service activities of all types, including service to the institution and to their professional organizations (Mamiseishvili et al., 2016).

One study identified four categories of identities of service: servants, politicians, veterans, and castaways. Servants are willing and able to do the work, regardless of whether or not they felt they had the time or were too tired. Politicians think about service work in terms of what projects would benefit themselves, and help to advance their careers. Veterans were typically between their second and third years. This aligned with the timing for their first reappointment and promotion. At this point in their careers, reality sets in that their research needs to be a priority if they have a chance at moving to the next rank. Ultimately, this results in what the participants described becoming more selective about the types of service in which they chose to engage. This was also the point at which one participant felt “overused and undervalued” (Reybold & Corda, 2011, p. 138). The last category, castaways, is the most disappointing. The participants who were in this category were those who had not had their expectations clearly met with respect to service work, and felt they had been discarded by their chair and dean, especially when it came time for promotion, tenure, and reappointment.
While participants of a few of the categories felt frustrated, the participants in the castaway category seemed to be the most deflated (Reybold & Corda, 2011). It has been shown that as faculty members moved towards professional maturity, their service identity would change as priorities and motivations shift (Mamiseishvili et al., 2016; Reybold & Corda, 2011).

**Women Faculty and Service Work**

Women faculty members who hold the rank of associate professor spend many more hours on service work than male faculty of the same rank (Misra et al., 2012; Neumann & Terosky, 2007). It is also noted that women tend to do more institutional service work and men lean more towards professional service in their area of study, which is considered more esteemed (Misra et al, 2012). Porter found at doctoral institutions, female faculty serve on 50% more committees as compared to male faculty (as cited by Pyke, 2014). When specifically focusing on STEM faculty at a research-intensive university, the comparisons of faculty time by gender show that faculty work is gendered. The percent of time that is spent on research: 42% for men, 27% for women; mentoring: 15% for men, 21% for women; service: 20% for men, 25% for women (Misra et al., 2011).

Social role theory suggests that this is due to the fact that women are more the caretakers of the home while men are at work (O'Meara, 2016). Women are doing more service work than men and more of the women’s service work is in support of the institution, which is akin to “taking care of the academic family” (Guarino & Borden, 2016, p. 19). A participant in a study by Acker, Webber, and Smyth (2016) states that in her department there is a sense that “service is women’s work” (p. 14). This is considered *identity taxation* in that service work is expected more from those who have been historically marginalized, and this includes women (Eagan & Garvey, 2015).
There are three major themes how women experience identity taxation. First, female faculty may feel as if they are the ‘token’ woman in faculty and committee meetings. Second, women faculty are expected to take a higher proportion of the mentoring and advising of the female students than the male faculty. Lastly, female faculty are disenfranchised by their male colleagues, especially those in the natural sciences. This has an effect on these women overall, not just hindering their careers, but also affecting their emotional health (Hirshfield & Joseph, 2012).

Neumann & Terosky (2007) share an anecdote from one female faculty member in a STEM field that talked about her interest in bringing a feminist speaker to campus. This request was consistently blocked and so she worked diligently to lobby for the funding to bring the speaker to campus herself, all the while her male colleagues were working to further their research. This is a clear example of how her institution, a gendered organization, blocked her from bringing the speaker to campus, and while she worked to overcome that issue, she fell behind in work that may have advanced her career.

Four possible explanations are suggested as to why women participate in disproportionately more service work than their male colleagues:

1. women may be asked to do more service work to help with gender equity on various institutional committees
2. men may feel more confident in being able to say “no” when asked to serve as compared to women due to institutions of higher education being gendered organizations
3. women may volunteer more for service work, perhaps due to social norms
4. women may be more likely to document their service (Guarino and Borden, 2016)
Some suggestions on how to improve the situation of women bearing the brunt of service work that, in turn, is preventing them from achieving promotion to the highest faculty rank is to assign resources to focus on the support and mentoring of faculty, especially women, to earn tenure and promotions to the highest faculty rank. The second recommendation is directed towards department chairs. It is suggested that chairs look at the service work performed by the members of their department and make sure that it is more evenly distributed not only by individual member, but also by gender. Lastly, it is suggested that colleges and universities more publicly recognize and reward exceptional service work in the same manner and level that is received for teaching and research (Misra et al., 2011).

**Women Progressing Through Faculty Ranks**

Tenure track positions at colleges and universities are typically comprised of three distinct levels. Assistant Professor, Associate Professor, and Professor, which is sometimes referred to as Full Professor. New faculty with a terminal degree in their subject area are typically hired at this rank and remain at this rank for five to seven years. Once the faculty member has successfully proven excellence in teaching, research, and service during their time at the Assistant Professor rank, they are eligible to be promoted to Associate Professor at which point they are also typically granted tenure. After a minimum of 10 years of proven excellence in teaching, research, and service, the faculty member can be promoted to Professor. Research has shown that colleges and universities are doing well when it comes to hiring women faculty for tenure-track positions in the STEM fields. Even though there are fewer applicants, female applicants are more likely to get hired. In one study of a six year period of hiring STEM faculty at a large wester research-oriented doctoral granting institution, it was found that even though the ratio of male to female applicants was 84.8% to 15.2%, the hiring percentages were more than
doubled for the women (4.28%) as compared to men (2.03%) (Glass & Minnotte, 2010). This same two to one ratio was replicated in a second much larger study involving 371 colleges and universities from all 50 states plus the District of Columbia in the areas of biology, engineering, economics, and psychology (Williams & Ceci, 2015).

Figure 2 shows the dramatic increase in the percentage of female Assistant Professors (indicated as Junior faculty) since 1975 from 11.2% to 42.5% (National Science Board, 2018). This is another data point to show women who earn their doctorates in STEM fields who choose to stay in academia are able to get hired into a tenure-track position. Unfortunately, this chart also shows that over the past 40 years, there has not been much change in the fact that women faculty in STEM fields are not progressing to the highest rank.

The unbalanced level of service work is a serious issue in that it is negatively impacting women faculty member’s chances at promotion, taking them away from their research, and ultimately causing them to not earn as much financially as their male colleagues (Guarino & Borden, 2016). The amount of service work women faculty members are performing is causing them to fall behind their male peers in terms of research productivity, recognition, compensation, and preventing them from advancing in academia, let along society (Eagan & Garvey, 2015; Vesterlund et al., 2014). It has been found that women faculty members are less likely to even reach a tenure review than their male colleagues (Shen, 2013). Women faculty members not progressing to the highest faculty rank is not unique to the United States, as similar issues have been researched in Canada and Austria (Acker et al., 2016; Fritsch, 2016).

Female faculty members may rise to earn tenure and earn the rank of Associate Professor, but struggle to earn that last promotion to Full Professor. Women faculty members are ten percent less likely to be promoted from Associate Professor to Full Professor than male faculty members, according to Laura Perna, a University of Pennsylvania researcher’s analysis of the National Study of Postsecondary Faculty (as cited by Misra et al., 2011). The careers of faculty members in the STEM fields clearly show the gendered workloads (Thomas, Poole, & Herbers, 2015). While men tend to protect the amount of time they devote to research, women tend to spend more of their time with students as well as doing work that “builds bridges around the university” (Misra et al., 2011 p. 2). Unfortunately, this type of work is not as valued during the promotion, tenure, and reappointment processing (Misra et al., 2011). Again, this is a global issue. In Spain, men are 2.5 times more likely to earn full professor than women with comparable credentials and home life (as cited by Shen, 2013).
Institutions of higher education have long held the promotion, tenure, and reappointment processes in confidence behind closed doors. The criteria for promotion and tenure is not clearly defined, leaving room for the reviews to be more subjective than objective (Dyer, 2004). An example of this is by the institution that will be used in this study. Lehigh University, defines the criteria to be applied to as “Excellence in teaching, research and scholarship, and service are the criteria for reappointment, tenure and promotion” (Rules and Procedures of the Faculty, 2018, Section 2.2.1.5). This criteria does not outline any specifics in what is meant by “excellence” leaving room for interpretation in the process. If this is viewed from the perspective of the faculty member going through the process, it may be hard for them to deliver what is expected without some clearer guidelines (Austin & Rice, 1998).

There are recommendations of what the both sides of the promotion, tenure, and reappointment process can to do alleviate the issue of the perceived “moving target” of success. From an institutional perspective, Dyer (2004) recommends the following:

- Design school policies that comply with antidiscrimination laws, and ensure that faculty and administrators understand and comply with those policies.
- Require annual written evaluations with explicit performance measures to address the candidate’s progress in research, service, and teaching.
- Recognize the power tenured professors have over junior faculty and students and actively watch for and monitor abuses.
- Take conflicts of interest in hiring or promotion seriously.
- Adopt a policy allowing for “time off the tenure clock” for childbirth and parenting.
- Treat rejected tenure candidates respectfully.
• Offer services to support faculty as they seek new positions

• Provide written tenure policies and procedures to all faculty and prospective employees. (pp. 79 – 80).

Dyer (2004) also has some recommendations for female faculty members:

Before accepting a job offer

• Ask for written information about the university’s promotion and tenure policy, including a description of recent tenure cases.

• Bear in mind that the chair of your department is likely to change before you are evaluated for tenure.

• Ask the department chair and other tenured faculty in your department what service, teaching, and scholarship will be needed for tenure and how your record will be weighed.

While on the job

• Keep your antenna up for the culture and politics of your department and institution.

• Cultivate friends, communities, and colleagues outside your department and outside academia.

• Do not expect to be rewarded for doing favors or for being flexible.

• In dire cases, consider cutting your losses early.

• Understand your rights as an employee under federal and state law.

• Immediately document any perceived discrimination. (pp. 81 – 82).

These recommendations, while specifically geared towards the women faculty members, are good suggestions for anyone in academia, regardless of gender. Focusing specifically on
female faculty members and their service work, recommendation of asking the department chairperson the specifics on what is needed with respect to service and how it will be measured is especially important.

Conclusion

The concept of service work began after the Morrill Act of 1862 and the Hatch Act of 1887 when the federal government provided land and funding to states which ultimately fostered the agricultural and mechanical revolution in the United States (Boyer, 1990). These Acts brought academia and the farmer together which encouraged a sense of democracy in colleges and universities where service ended up being a pillar of existence.

Fast forward to present day where there are more women faculty members in academia than ever before (Curtis, 2013). It has been shown that women faculty members are performing more service work than their male counterparts. This could be due to the fact that women faculty members are being asked more often than men to serve, or men feeling more confidence in being able to “just say no” to requests.

It has also been found that women faculty members do more internal service work, while male faculty members tend to do more external service work. The type of service work male faculty members perform is regarded as more esteemed and is more valuable to their career than the types of service work performed by their female colleagues. This burden of service work has a detrimental effect on the careers of the female faculty in STEM fields. Women are not progressing to the highest rank of Full Professor due to the fact that they are spending more of their time on service that is taking time away from their research. Service activities are not as valued in the promotion, tenure, and reappointment processes as research, so women faculty members’ careers are being negatively impacted by this gendering of service work.
Organizational Benefits of Gender Diversity

Institutions of higher education could learn a few things from some research that has been done in industry with respect to gender equity on work teams. It is well known that gender equity on work teams has shown to increase innovation and more creative problem solving, but research has shown that gender equity on teams and in leadership positions also has a positive and significant impact on profits and company valuation (Dezso & Ross, 2012; Richard et al., 2013). There is also research that shows that if there is not gender equity, how there is a negative impact to the team and to the lone woman team member (Wolman & Frank, 1975). In order for institutions to be able to realize the benefits of a diverse workforce, not only for women, but for any underrepresented group, it is recommended that they put into practice concerted recruitment and retention efforts (Bell, 2006). The remainder of this section highlights some of the research that supports these claims.

Diversity Increases Innovation

White men have dominated academia in the United States from the start, as both members of faculty and students. Fortunately, this has been changing over time, but colleges and universities are still struggling to diversify both of these populations not only from a gender perspective, but also with regards to race and ethnicity. Many institutions of higher education have defined diversity targets to grow their underrepresented populations. These minority populations could be defined by race and ethnicity, socioeconomic status, gender, or other attributes. While the student population is not easy to adjust, with concerted efforts, and a new class entering each year and a class graduating and leaving, it is easier to see a change over a specific timeframe. From a faculty member perspective, it takes a longer timeframe to realize diversity efforts due to the longevity of faculty careers at a single institution.
Research has shown that diversity in the classroom has fostered innovation, increased problem solving, enriched learning and graduate at higher rates (as cited by Tienda, 2013). These same outcomes would benefit faculty in terms of their research. “Innovation within an institution is manifested primarily by the faculty” (Gialamas et al., 2013, p. 76). If there were more female faculty in STEM fields in an institution, the teams on faculty research could have more gender equity, which would then provide more perspectives and increase innovation and more creative problem solving. This could then give the institution a more competitive advantage to attract a higher caliber of student but also in terms of research funding and reputation.

There has been a lot of research on how gender diversity positively impacts performance of business teams, and therefore the bottom line of companies. Participative Strategy Management (PSM) is a management strategy in which all employees are encouraged to participate in the strategic decisions of the company. It has been shown the higher the level of gender diversity in a management team, and the higher the participative strategy making, the higher the return on assets for the company (Richard et al., 2013).

Institutions of higher education parallel other industries in that they, too, have a lower number of women in leadership positions than men. Even though women represent 44% of full time faculty members, women represent only 29% of full professors, the highest faculty rank (Curtis, 2013). We need to keep in mind that this 29% represents an average across all disciplines, and is lower in the STEM fields.

Does having women in top management had a positive effect on the company’s performance? Yes, there is a correlation between the representation of women and innovation intensity. Having women in leadership roles also has a positive and significant impact on the company in economic terms (Dezso & Ross, 2012). Sales and profits of a team increases as the
gender diversity becomes more equitable; this means that teams that are more equal in the number of men and women do better than those that are male or female dominated (Hoogendoorn, Oosterbeek, & Van Praag, 2013).

**Impacts of Gender Inequity**

Research has also been done in industry on the impacts of having gender inequity on teams. If there is a single woman in a work group, she has a higher likeliness of becoming a deviant or isolate (Wolman & Frank, 1975). A deviant is defined as someone who may be ignored by the rest of the group and therefore their input is not heard. An isolate interacts very little with the rest of the group. The woman who is identified as the token in her work group may perceive that she is being discriminated against and feels her inputs are not heard or considered, her productivity will decrease (King, Hebl, George, & Matusik, 2010). This is not good for the team in that they have one less person to help with the work or to help problem solve.

**Organizational Citizenship and Commitment**

It is known in higher education that it costs the institution less time, effort, and money to retain the students they already have than to go out and recruit more to take their place if they choose to leave. The same can be said for faculty. It is less costly to retain a faculty member once they have been hired than it is to hire another if someone chooses to leave. For certain faculty populations, especially the STEM fields, the costs to replace someone have dramatically increased (Thomas et al., 2015). In addition, the recruitment effort is made more challenging in that many institutions are focusing their efforts on creating a diverse faculty. “An institution’s most important asset is a diverse workforce in which the contributions of each individual are respected and valued” (Moses, 2012, p. 1).
Faculty turnover costs the institutions in many aspects. The departed faculty member’s productivity is lost, and their teaching and service workload is then passed along to the remaining faculty. Any research the faculty member was leading typically follows them wherever they go, including the funding. There may also be costs associated with retaining women in STEM who are being recruited by other institutions (as cited by Chang et al., 2016). With the recent economic struggles that many colleges and universities face, it has become more challenging to find the resources to keep replacing women faculty (Villablanca & Howell, 2016). The costs for recruiting and training new faculty at academic health centers ranges from 1.5 times a first-year salary up to $900,000 (Chang et al., 2016).

It is suggested that institutions put some of their limited resources into new programs or revamp existing programs such as new faculty orientations. A learner-centered faculty orientation approach, akin to approaches that have been lauded in the classroom as being so effective, are being suggested (Scott, Lemus, Knotts, and Oh, 2016). Learner-centered approaches engage the learner. Applying this to new faculty orientations will allow the new faculty to network with their peers and build relationships while also identifying individual strengths that could benefit the institution overall. Employees identify with the shared goals of their employer more readily when their perception of the support of leaders and the organization as a whole make a vested interest in the employees’ well-being (Lawrence et al., 2012; Scott et al., 2016). Increased organizational citizenship causes faculty to be more engaged and, in turn, increases retention.

Other types of programs that are beneficial to retaining women faculty are career development programs. Women faculty members who participated in career development programs were less likely to leave academic medicine as compared to their colleagues who did
not participate in such a program (Chang, et al., 2016). More women being retained in the professoriate allows for more women to rise into leadership positions.

A program at the University of California Davis School of Medicine that provided opportunities for networking, mentorship, career development, and more. Studying the results of this program, the institution found their departure rate for women (34%) is lower than the national rate (40%) reported by the Association of American Medical Colleges (Bauman, Howell, & Villablanca, 2014). Admittedly, there are costs related to create, implement, and support programs such as learner-centered new faculty orientations and career development programs. “…it is clear that the success of women goes beyond creating an equal opportunity environment and is also dependent upon providing guidance and support to help them achieve their goals” (Lodish, 2015, p. 110). Institutions must keep in mind that these programs are much more cost effective than having to recruit and train new women faculty.

Conclusion

The research identified in this section shows that diversity in work groups has a positive impact on creativity, innovation, and success of those teams which often leads to increased financial benefits for the organization. This does not imply that having a disproportionate number of men and women in a working group solves the problem. A “token” person in a workgroup may negatively impact that individual’s productivity and output, and may bring down the rest of the team.

Not only is this an issue for the institution in the cost of that lone female faculty member from the perspective of work product, but also in the fact that the likeliness of that female faculty member to remain at that institution is minimized. This means the institution will more than likely need to recruit another faculty member to take her place. Ultimately, it is best from a
financial perspective to have gender equity from the work product and the retention viewpoints. Programs that focus on supporting female faculty members have shown to increase organizational citizenship and therefore retention.

Impact on Students

The United States is facing a gap between the supply and demand of workers with STEM skills. In 2016, 500,000 information technology positions went unfilled. It was projected that there would be 2.4 million STEM jobs open in 2018, and by 2022, one million more employees will be needed to meet the demands in the United States (McLymont, 2016). It is considered imperative for the country’s global competitiveness and economic growth to have enough American workers with STEM skills. If colleges and universities do not address the lack of women and underrepresented minorities studying in STEM fields, the chances of meeting the required workforce is greatly minimized.

Another aspect of gender bias in STEM fields is the wage gap between men and women. Women who work full time year round only earn 80% of what men earn (Income and Poverty in the United States: 2016, 2017). The median wage earned by the highest traditionally female occupation is less than half of that of the highest traditionally male occupation (Toglia, 2013). This means that the areas in which girls have been encouraged to study and work do not provide the same opportunity for earnings over their lifetime. Institutions of higher education should be concerned with this, as one of the main goals of higher education is to educate citizens for a better society. If half the population is not reaching their potential either academically or financially, higher education is not achieving the goal of bettering the community.

Faculty members have the ability to shape the future of the STEM workforce. In particular, faculty members who are advisors hold the keys to their students’ academic futures.
For example, faculty advisors make the selection on who will be a research assistant as opposed to a teaching assistant. Teaching assistants do not publish as often during their graduate studies as research assistants, which is a predictor of academic success (Leggon, 2010). A more diverse faculty would then imply more interest from and towards a more diverse student population. A more diverse faculty allows for more students to be able to identify with someone who looks like them (Leggon, 2010).

**Impact on Female Undergraduate Students**

Does a professor’s gender have an impact on students in STEM subjects? Female students studying in a STEM field having a female faculty member as an instructor has a positive impact on the likeliness of the student taking more STEM coursework, and graduating with a STEM degree (Carrell, Page, & West, 2010). Similarly, it has been found that female instructors in the most quantitative majors had a positive impact on female students taking additional courses in those areas; these students were as much as twice as likely to take more courses (Bettinger & Long, 2005). The percentage of women faculty members at a college or university is the highest predictor of success for female undergraduate students (Trower & Chait, 2002). However, not all research has provided these same results. Other findings have shown that instructor gender has little impact on college student achievement (Hoffmann & Oreopoulos, 2009).

While it may be inconclusive as to whether an instructor’s gender has an impact on female students in STEM courses, women faculty members can have an impact on female undergraduate students in other ways. When female undergraduate students see women faculty members in STEM fields performing their research, service, and teaching, there are opportunities to inspire them to want to do the same. This will help to foster the talents of these young women
and to show that gender diversity has a place in STEM fields (Laursen, Austin, Soto, & Martinez, 2015).

Not only is the presence of women faculty members important to encourage female students to major in STEM fields, but the female students need to be able to identify with these faculty members in order for their presence to make a difference. Sharing the biases women faculty in STEM fields face has shown to have positive impacts on the students’ choices on coursework, mentors, and working in the labs with these female faculty members (Pietri, Johnson, Ozgumus, & Young, 2018).

**Impact on Female Graduate Students in STEM**

Women faculty in STEM fields who advise and mentor female graduate students studying STEM majors have the ability to make a large impact on the career choices of the students. At this point in their academic careers, female students are looking to their advisor as more than an academic role model, but also as a role model for their future, which is closer to them than ever before. Many students studying straight through to their doctorates have not had a true reality check of what their life could look like after graduation. These women, who are about to graduate, are looking at the faculty at their institution with a lens of imaging themselves in that very position in a short amount of time with thoughts of how to balance work and home life (Curtis, 2013).

Historically, there is an issue for female Ph.D. students choosing to remain in academia (Shaw & Stanton, 2012). Institutions should ensure the female faculty members who have the ability to create an impression on the soon-to-be doctorate’s decision to either join academia or the workforce elsewhere, are able to exude the positive aspects of their role within the institution. For example, if women are not provided the means by which to earn tenure or the highest faculty
ranks, this make come through to the faculty mentor and negatively impact the graduate student’s decision to join academia thinking there is limited growth potential as oppose to joining corporate America. In one study on female Ph.D. students studying chemistry, it was found that having a female faculty member as an advisor and two positive outcomes. The first being these students tended to be more productive during their doctoral studies; the second being these students were much more likely to remain in academia and become faculty members themselves (Gaule & Piacentini, 2018).

Continued support for the need of more women faculty members in STEM fields can be found in a research study on 933 Ph.D. students enrolled in programs in engineering and the natural sciences. This study compared the research output based upon pairings of student and advisor gender. It was determined that students, regardless of sex, with female advisors produce more publications. This finding alone should be enough to sway leadership in STEM fields in colleges and universities to focus on minimizing the gender gaps in the STEM professorate. On the other end of the spectrum, this study also showed than women students paired with male advisors produce the least amount of publications. Again, this is another reason why it is important for female graduate students to have access to more women faculty members (Pezzoni, Mairesse, Stephan, & Lane, 2016).

To take this concept a step further, there are even fewer women faculty of color in STEM fields. A Black postdoctoral fellow in a mathematics-based science program in one study, expressed concerns of the lack of relatable role models in the faculty that could support her in her journey. Her concerns consisted of how to start to build her family and create a work-life balance and that there was no one to which she could relate as a Black woman in the STEM fields in academia (Kachchaf, Ko, Hodari, & Ong, 2015).
Female faculty members not only have an impact on the career outcomes of their female graduate students, but they also have an impact on decreasing the amount of time the student takes to complete their graduate degree (Neumark & Gardecki, 1998). In order to reap the benefits of this, it is suggested to encourage female faculty members to mentor or be role-models for their graduate students. In order to do this, however, colleges and universities need to have enough women faculty members in the STEM fields to mentor the female graduate students in the STEM programs.

Conclusion

Colleges and universities have a definite challenge when it comes to increasing the number of women faculty in the STEM fields. It can be seen from the research that having female faculty members has a positive impact on both female undergraduate and graduate students. On the undergraduate level, having women faculty members in the STEM fields has been shown to have a positive impact on the number of female undergraduate students choosing to study in a STEM field. At the graduate level, women faculty members have a positive impact on all students with respect to publication output. Women faculty members also have a positive impact on the retention of women graduate students as well as the inclination of those women graduate students staying in academia upon graduation. This is the same effect as in industry. When a company’s leadership includes women, it leads the women in lower roles within the company to believe they, too, can succeed at that company (Dezso & Ross, 2012).

Unfortunately, there are not many women faculty members in the STEM fields today, and therefore, there are not very many role models for the current doctoral students to want to emulate. This means that the existing female faculty members need to be in a position to be able to encourage their female students to want to make the move into academia upon graduation.
These women need to see that they themselves feel accepted as part of the STEM professoriate and have an opportunity for growth within the organization. Once the female faculty feel a sense of organizational commitment, they can then encourage more women doctoral candidates into joining academia upon graduation. This would help the institution to meet their goals of a more gender equitable faculty, which will more than likely bring about better results for the institution with respect to research and competitiveness.

Summary

Colleges and universities have a disproportionately high number of male faculty members than female faculty members in the STEM fields. Women faculty members in the STEM fields tend to outnumber their male colleagues at the lower faculty ranks, yet are outnumbered by men at the highest rank. It has been posited that this is due to the fact that female faculty members are being burdened by service work that is taking time away from other scholarly activities that bear more weight during the promotion, tenure, and reappointment process. More research on how female members of faculty experience the promotion, tenure, and reappointment process with respect to service work is certainly needed. There is not much research to date on faculty service work let alone, on the impact of faculty service work on female faculty members’ ability to progress to the highest faculty ranks.

Colleges and universities have adjusted some of their practices and procedures in order to minimize gender inequity among faculty. The National Science Foundation ADVANCE grant program provides research funding to increase the participation of women in academic science and engineering careers (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383). There are institutions that have ADVANCE programs on their campus to help with the recruitment and mentoring of women faculty, educating their campus about unconscious bias, and how men can
be allies for their female colleagues. This funding from the National Science Foundation shows that there is still work to be done to minimize any gender inequities that exist on college campuses.

Gender equity among the faculty members in STEM areas is a challenging yet rewarding issue for colleges and universities to resolve. After reviewing the research for this paper, it seems as though it is a self-fulfilling prophecy. If institutions of higher education focus on the women faculty members in STEM fields by supporting them throughout their careers, organizational commitment and citizenship increases and causes the retention of these female faculty members to increase.

More women faculty members in STEM areas who are committed to their institution, have a positive impact on more female undergraduate students graduating with STEM degrees, and more doctoral candidates joining the professorate. Adding more female faculty to the STEM fields encourages this cycle over and over again. This is not only true with respect to women, but to any underrepresented population.

Another positive side effect of graduating more women doctoral students in the STEM fields and having them join academia is more gender equity in the academic departments. This paper has shown that teams with gender equity have increased profits as compared to teams with single gender representation. This could result in better research for the department and the institution, not to mention other positive side effects as attracting better quality students.

Topics for consideration for future research includes more research on service work in higher education as this is the least studied of the faculty’s responsibilities of research, teaching, and service (Neumann & Terosky, 2007). One area that might be good to pursue is how members of faculty are guided to record and keep track of their service. Faculty ePortfolio systems are just
starting to make their way onto college campuses in order to track faculty efforts in a single repository. These repositories enable faculty and leadership to be able to more readily view and report on the types of work in which faculty are participating, what region of the country or world is being studied, and allow for more collaboration. It is suspected that research is the main focus of these applications. As mentioned previously, service work is “nebulous” and hard to define, therefore it may not be conducive to being captured in a structured data format in a computer system. Due to this lack of hard data, it is challenging for quantitative researchers to create some metrics on this topic. Therefore, it is imperative that the qualitative researchers continue to do their work capturing experiences surrounding service work.
Chapter Three: Research Design

The purpose of this Interpretative Phenomenological Analysis (IPA) is to understand how women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion, tenure, and reappointment process with respect to their service work. The following is the research question for this study:

- How do female faculty in STEM fields experience the promotion, tenure, and reappointment process with respect to their service work?

The remainder of this chapter will discuss the approach to qualitative research and how this study will fit into that approach. The second section will provide a description of the participants and how they were recruited for the research study. The following section describes the procedures followed during the study, including the collection of the data, data analysis, and presentation of the data. The final section of this chapter describes the quality of the research study, including the ethics, credibility, transferability, confirmability as well as the researchers positionality and the limitations of the study.

**Qualitative Research Approach**

This research study was qualitative in nature. Qualitative research can be defined as a study of a specific phenomenon in its natural setting via a method of inquiry using words, pictures, videos, or other objects and analyzing them within the context in which they are collected (Jencik, 2016). Qualitative research is conducted when the goal is to “empower individuals” to share their stories and let their voices be heard (Creswell, 2013, p. 48). The qualitative researcher attempts to understand the lived experiences of the participants of the study (Jencik, 2016). This concept of “lived experiences” is also known as *Erlebnis*, which was
coined by Wilhelm Dilthey in 1927. This comes from the verb *erleben* in German which means “to live to see” (as cited by Burch, 1990).

The constructivist-interpretivist paradigm is the foundation for qualitative research methods (Ponterotto, 2005). Constructivism-interpretivism does not describe the world in simple truths, as positivism would. Constructivism-interpretivism takes into consideration that the researcher themselves are describing the world from their perspective, and that multiple truths exist based upon each researcher’s perspectives (Butin, 2010).

This study fits into the qualitative research approach in that it seeks to uncover how women faculty members in STEM fields experience the promotion, tenure, and reappointment process with respect to their service work. The goal of this research was to uncover the participants’ *lived experiences* and how they make sense of their experiences. This study falls into the constructivist-interpretivist paradigm in that it seeks to view the topic at hand from the perspective of the women faculty members themselves. Of course, it will be the researcher’s interpretations of the women faculty members’ perspectives.

**Methodology**

The methodological approach for this study is Interpretative Phenomenological Analysis (IPA). Heidegger is responsible for the start of the interpretative phenomenological approach. He was a student of Husserl, who started the descriptive phenomenological approach. The descriptive phenomenological approach believes “reality is considered objective and independent of history and context” (Lopez & Willis, 2004, p. 728) while the interpretative phenomenological approach states “individuals’ realities are invariably influenced by the world in which they live” (Lopez & Willis, 2004, p. 729). That is to say, the fundamental difference between
descriptive and interpretive phenomenological approaches is the fact that the descriptive
approach takes away context, environment, and individual perspective while looking at a specific
problem stating there is one and only one way to make sense of the issue, while interpretive
approach finds those same things integral to making sense of the specific problem, and there are
many ways in which to make meanings and sense of the issue.

There are three basic tenants of interpretative phenomenological analysis: phenomenology, hermeneutics, and idiography (Smith, Flowers, & Larkin, 2009; Wagstaff et al., 2014). “Phenomenology is a philosophical approach to the study of experience” (Smith et al., 2009, p. 11). IPA is phenomenological in that it has a goal to identify participants’ meaning of their experiences and how they make sense of that meaning (Smith, 2011). In other words, IPA focuses on gaining the understanding the meaning of human experience (Shaw, 2010).

The second tenant of interpretative phenomenological analysis is hermeneutics, which is the theory of interpretation (Smith et al., 2009). IPA employs what is known as a double hermeneutic. It is a double hermeneutic in that not only is the participant trying to interpret meaning of their experiences (single hermeneutic) but the researcher adds a second layer of interpretation (double hermeneutic) of meaning making (Smith, 2011).

The third and final tenant of interpretative phenomenological analysis is idiography, which is the concern of the particular (Smith et al, 2009). This concern of the particular is two-fold in IPA. The first is in the depth of the analysis of the detail of each individual case and the second is in the understanding of the phenomenon by looking for patterns and themes across cases of a particular group of people in a particular context (Smith, 2011; Smith et al., 2009).

This project was within the three basic tenants of an IPA study. It was phenomenological in that the purpose of the study was to uncover how women faculty members in STEM fields
experienced the promotion, tenure, and reappointment process with respect to service work. Since phenomenology is the study of experience, this was in alignment. The study followed the second tenant, hermeneutic, in that the researcher performed interviews with participants to uncover how they made sense of their experience. The research project was technically double hermeneutic in that the researcher analyzed the collected information and attempted to make sense of the participants’ sense making. The study followed the third and final tenant in that it was ideographic. This study focused specifically on women faculty members in STEM fields who have gone through at least their first reappointment in STEM departments where women are greatly outnumbered by men at Lehigh University. IPA was an appropriate approach for this research study as it met the three characteristics.

**Participants**

According to Merriam (1998), qualitative studies use non-probability sampling. Within non-probabilistic sample strategies, the most common form of sampling is Chein’s (1981) *purposive* or Patton’s (1980) *purposeful* (as cited by Merriam, 1998). “Purposive sampling is based upon the assumption that one wants to discover, understand, gain insight; therefore one needs to select a sample from which one can learn the most” (Merriam, 1998, p. 48). The participants for this study were recruited purposefully, to ensure they have the desired characteristics for this particular study (Gordon-Finlayson, 2010).

The participants were selected a priori, at the start of the project. The site was Lehigh University, a higher research activity doctoral university located in the northeastern United States (The Carnegie Classification of Institutions of Higher Education, n.d.). Participants were recruited from female faculty members who are in STEM departments at Lehigh University where the number of male tenured/tenure track faculty greatly outnumber female tenured/tenure
track faculty in order to align with the selected theoretical framework, Tajfel and Turner’s social identity theory. Participants were recruited from those who have successfully gone through at least the first reappointment process, and therefore, were Associate or Full professors.

At Lehigh University, 17 academic departments were identified as STEM departments by the Lehigh University ADVANCE Center for Women STEM Faculty. In reviewing the comparison of male to female tenure track faculty members there were 12 academic departments with 25% or less female tenured/tenure track faculty members. Four of these departments did not have any female faculty members who had gone through at least their first reappointment. This left eight remaining academic departments. Four of these eight remaining academic departments each had at least one female faculty member at the rank of Associate Professor and at least one female faculty member at the rank of Full Professor. A total of ten women faculty members were recruited to participate in the study.

In qualitative research, and specifically in phenomenological studies, the number of research participants can vary widely (Creswell, 2013). While theoretically, a phenomenological study could be done using a single participant, it is suggested to expand the number somewhere between three and ten (Dukes, 1984). Wagstaff et al., (2014) discuss sample sizes of two different studies. In one study there were 13 participants, which is considered large, and the researcher was inundated with data. In a second study, there were four participants, and the researcher mentioned how surprised by the richness of the data with such a small population. With this in mind, the ten participants from the four identified departments was in alignment. It was decided that a minimum of four participants was acceptable in case not all potential participants chose to participate.
Four of the respondents to the request to participate were eligible to take part in the study. Table 1 shows each participant with their rank. In order to be mindful of retaining anonymity, the participants’ college, department, and any other information that may be used to identify them will not be shared.

Table 1

Participants with Rank

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maryanne</td>
<td>Full Professor</td>
</tr>
<tr>
<td>Theresa</td>
<td>Full Professor</td>
</tr>
<tr>
<td>Kelly</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Carol</td>
<td>Associate Professor</td>
</tr>
<tr>
<td></td>
<td>with tenure</td>
</tr>
</tbody>
</table>

Procedures

Data Collection

Approval from the Northeastern University Institutional Review Board (IRB) as well the Lehigh University IRB was obtained prior to the start of data collection. Data from Lehigh University databases and the Office of the Provost was utilized to identify potential study participants and provide context. Once the population of potential participants was identified, an email was sent requesting participation in the study. Data collection with each participant included semi-structured interviews. This is a methodology that is conducted with one interviewer (the researcher) and one interviewee where there is a flexible list of questions and topics that may be adjusted per interviewee dependent upon the direction of the discussion (Shaw, 2010). This type of interview allows the interviewer and interviewee to make a
connection, allowing the participant to share their story in-depth (Reid, Flowers, & Larkin, 2005). Upon completion of the interviews, each was transcribed into text for data analysis.

**Data Analysis**

**Methodology.** After the interviews were transcribed into text, the following the following six steps to data analysis in IPA research studies was performed (Smith et. al, 2009).

**Step 1 - Reading and re-reading the data.** In this step, the researcher listened to the recording of the semi-structured interview at least once while reading the transcription of the interview in order to get herself engaged with the data and the voice of the participant (Smith et. al, 2009).

**Step 2 - Initial noting** This step helped the researcher identify how the participant thinks about and verbalizes the topic. In this step, the goal was to “produce a comprehensive and detailed set of notes and comments on the data” (Smith et. al, 2009, p. 83). Three different types of notation will be taken: descriptive comments, linguistic comments, and conceptual comments (Smith et. al, 2009).

**Step 3 - Developing emergent themes.** In this step, the researcher moved from focusing on the transcription of the interview to the notes made on the transcript with the goal of coming up with phrases that succinctly described the salient points of the interview (Smith et. al, 2009).

**Step 4 - Searching for connections across emergent themes.** At this point, the researcher took the list of emergent themes in the order in which they occurred in the transcript, and attempt to reorganize them by clustering like themes and physically organizing these themes in order of their relation to each other (Smith et. al, 2009).

**Step 5 - Moving to the next case.** Steps 1 through 4 was then repeated for each participants’ transcribed interviews. The researcher attempted to analyze each participants’
transcriptions mutually exclusively during this step as much as possible to allow for individuality (Smith et al, 2009).

**Step 6 - Looking for patterns across cases.** Once each of the individual interviews were coded and tables were created, a final table was compiled with the data from each of the individual tables into one final table. This provided a means to view the results and perform cross case synthesis, as well as identify any predominant themes across the participants in the study.

**Criteria for Quality Qualitative Research**

Lincoln and Guba (1985) have defined criterion upon which qualitative research studies should adhere to ensure trustworthiness of the study. The four criterion include: credibility, transferability, dependability, and confirmability (as cited by Cohen & Crabtree, 2006). The remainder of this section will review how this study will be conducted in order to adhere to these guidelines. “Guidelines provide a path to expertise” (Tracy, 2010).

**Ethical Considerations**

In order to provide anonymity of the participants in the research study, each participant was identified by a pseudonym only known to the researcher. The college and academic department in which they are a member was also anonymized due to the fact that at Lehigh University many times there is only one female faculty member of a specific rank within a department and therefore one could determine the participant from those characteristics. Prior to the start of each participants’ first interview, the researcher disclosed the steps that will be taken to protect their identity (Seidman, 2006).
Any files, file names, and documents that were created only included the pseudonyms of the participants. The mapping of the participants’ true names to their corresponding pseudonyms will only be known to the researcher.

Credibility

The researcher conducted one interview with each participant following the methodology outlined by Seidman (2006). The first part of the interview gathered background information on the participant, focusing on their experiences earlier in life up to and including how they chose their career in a STEM field in academia. The second part of the interview involved detailed discussion on the participants current experiences with the promotion, tenure, and reappointment process with respect to their service work. The last part interview consisted of participants reflections on the meaning of their experiences from the first and second parts of the interviews.

Transferability

A reader of the study will judge the credibility of the study on the basis of its thick description (Pontorotto, 2005). Thick description is a term used to describe the richness of the researcher’s writing of their field experiences to provide context surrounding any patterns uncovered (Cohen & Crabtree, 2006). This concept brings us back to the third tenant of IPA, idiography. This is where the researcher is concerned with the particular, every detail of the complex topic under study (Smith et al., 2009). Each participants’ experiences analyzed individually, and then subsequently across participants’ experiences looking for themes (Smith, 2011; Smith et al., 2009).

Transferability means the reader can absorb the information provided in the research study and abstract the results out to apply them to another possible situation. This is a different
type of goal for a qualitative IPA research study; IPA does not seek to make generalizations about larger populations based upon a specific study (Smith et al., 2009).

Confirmability

An internal audit was conducted during this research study as to be able to provide documentation as to how the researcher was able to go from the raw data collected during the interview process to the interpretation of the results (Shaw, 2010). This internal audit included the research question, field notes, memos, audio recordings, annotated transcripts, and versioning of the drafts of the final report. The use of an internal audit helps provide transparency to the reader and any external auditor of the study. This provides the means for someone to evaluate if the data supports the findings (Cohen & Crabtree, 2006). Transparency is another aspect in making sure the research study is trustworthy (Shaw, 2010).

Self-reflexivity

While the researcher is not a faculty member, she does hold a master’s degree in mathematics and therefore, is technically a woman in a STEM field. The researcher worked in the software industry for ten years and while there were a large number of women employed by the company, there was a definite distinction in the types of positions women held. The researcher worked in a more technical area so she was in the minority with respect to gender. The experiences of female faculty members not being promoted or earning tenure at the same rate as men, or at all, does resonate with me and makes me want to research this topic and share my findings in the hopes of changing the status quo of the future.

Limitations

Even though small sample sizes are acceptable in IPA qualitative research studies, there was truly a small population of potential participants at Lehigh University who fulfilled the attributes
required by the study. Another limitation was be the ability to conduct this same study at a “like” institution. Lehigh University is a higher research activity doctoral university yet the size of the institution is considered on small to medium. There are not many institutions, especially in the northeast portion of the United States that have similar characteristics.
Chapter Four: Findings and Analysis

The purpose of this study was to understand how women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion and tenure process with respect to their service work. The analysis of the four transcripts yielded five superordinate themes, each with sub-themes. The superordinate themes are as follows: Service Burden, Promotion, Tenure, & Reappointment Process, Value of Service Work, Microaggressions, and Type of Service Work. These themes and sub-themes can be found in Table 2. This chapter will explore each of the superordinate themes and their corresponding sub-themes.

Table 2

Superordinate Themes and Sub-Themes

<table>
<thead>
<tr>
<th>Superordinate Theme</th>
<th>Sub-themes</th>
</tr>
</thead>
</table>
| Service Burden      | • Time Spent and Amount of Service Work  
                     • Say “No” to Service Work  
                     • Impact on Career  
                     • Impact on Research  
                     • Protection From Service Work  
                     • Institutional Practices Requiring Female Representation |
| Promotion, Tenure, & Reappointment Process | • Harder for women  
                                            • Length of time for promotion |
| Value of Service Work | • Service work did not contribute to promotion  
                          • Value is in the eye of the Beholder  
                          • Service work is just something that has to be done  
                          • External service work more valued than internal |
| Microaggressions    | • Feeling other-ed  
                     • Stereotyping  
                     • Lack of respect |
| Types of Service Work | • Men and Women Members of Faculty do Different Types of Service Work |
Service Burden

The first superordinate theme that emerged in this study describes the women faculty members in STEM fields experiences with service burden. Blackburn and Lawrence (1995) define service as a “catchall name for everything that is neither teaching, research, nor scholarship” (p. 222). Service burden is experienced by members of faculty when they are overwhelmed by the amount of internal or administrative work they are performing and the amount of time they are spending on the service is interfering with their other responsibilities, such as research. One way in which service burden is manifested is by repeatedly asking those who are underrepresented to participate on various committees as part of the University’s diversity and inclusion efforts. Service burden was the most talked about topic among the participants and all four participants in this study mention service burden at some point. Service burden occurs for certain populations of members of faculty, especially when that population is underrepresented. Lehigh University has a recommended breakdown of the how members of faculty should spend their time. The default definition has teaching at 40%, research and scholarship at 40%, and service at 20%. While service burden was by far the most popular theme found among the transcripts, it is important to note that there is a difference of opinion on service burden by participant rank.

The researcher found six sub-themes across participants related to service burden. The first being time spent and amount of service work. Those who are still going through the process at the associate professor rank are much more verbal and passionate about the burden than those who have already attained the rank of full professor. The second sub-theme that emerged was their perception on whether or not they could say “no” to service work noting it is harder to do so when the request for service came from a superior. Both of the women who hold the rank of
associate professor have consciously decided to continue doing the type of work they feel is valuable to them and/or the institution knowing it is impacting their promotability and the trajectory of their individual careers, which is the third sub-theme. The fourth sub-theme of service burden that emerged, impact on research, was also experienced by the associate professors in that they both spoke about working more hours to accommodate the extra service work in their schedules and sacrificing time away from their research and families to accomplish everything they want to do. Protection from service work, the fifth sub-theme, emerged from three of the four participants and was different depending upon rank. There were different experiences as to whether or not the department chairperson would protect assistant faculty members from service burden as they have to focus their time and efforts elsewhere, but there was also the comments that those at the associate level need protection to get to the rank of full professor. This leads right into the sixth and final sub-theme of institutional practices requiring female representation which causes some of the burden for the associate professors in the study.

**Time Spent and Amount of Service Work**

Those who have already earned the rank of full professor did not share such strong feelings regarding the burden as those who are at the rank of associate professor. Theresa, a full professor, thinks 20% is a reasonable number to describe the amount of her time spent on service work when she was going through the promotion, tenure, and reappointment process. Maryanne, the other full professor among the participants also thought 20% was accurate. As for Kelly and Carol, both of whom are at the rank of associate professor with tenure, think that 20% is too low. Carol said she “definitely spends more” than 20% of her time on service work and also says the following
I feel really strongly about what I am doing and the reasons that I am doing it and I don't want the promotion and tenure ... I don't want to be a slave to the promotion and tenure process.

However, she also admits to working more hours to compensate for the time she spends on service work in order to accomplish her other duties.

Kelly has been told more than once that she does “too much service work.” Even the Provost has said this to her. Kelly posits that she spends far more time performing service work than her male colleague going through the same stage of the promotion, tenure, and reappointment process at the same time. Kelly now reviews dossiers of those going through the tenure process and noted that the male faculty members she is reviewing have “significantly less” service than she did when going through the process. On the other hand, Theresa did not think she spent any more time on service work than her male counterparts going through the promotion, tenure, and reappointment process at the same time.

Say “No” to Service Work

Maryanne shared that when she was going through the promotion, tenure, and reappointment process she was asked to do a lot of committee work. She did whatever service work was asked of her, just working through it as it was part of her job. She went along with whatever the chair suggested and said yes to all of the requests because she did not realize that she had a choice and could say no.

The participants have experienced difficulties in saying no to a request to perform service work especially when that request comes from a superior. When asked if she felt she could say “no” to request to perform service work, Thresa said the following,
I think it depends on your strengths of why you don't want to do it. I mean, if you're, if you're overwhelmed or you really feel you wouldn't do a good job, I, I think you can say no. I, I realize though, of course it's just in hindsight a long time ago, I realize that as junior faculty member, you do feel more constrained. That you, um, you know, when requests come from above you, obviously it's a bit different from if you're a full professor or something else like that.

Theresa’s second point was in alignment with a situation Carol experienced when her Dean asked for some of her time to serve on a committee. Carol felt she had to say yes or “it would come back to haunt her.” Kelly also mentions finding it hard to say no when the request is coming from a superior, especially if it is something she herself believes is important to the University. As a result of this, she ends up performing a lot of service work that her department needs her to do.

Kelly feels obligated to pass along her lesson learned to the faculty members who are coming after her.

I'm trying to protect my younger colleagues from getting signed up for things that they shouldn't be doing. Um, because of what the institution values, and encouraging them to wait until at least they've got a couple of research grants to then start to think about things that are kind of outside of their- their core mission as a pre-tenure faculty member. Encouraging them to only say yes to things that are really truly important to them, and to not fall prey to the guilt that I often felt early on.

**Impact on career**

The associate professors in this study are both experiencing that significant service burden is influencing the trajectory of their careers, while the full professors did not discuss this
at all. Kelly and Carol both dwell upon on having to make tough decisions with respect to their service work and their careers. Carol sometimes prioritizes the service work over promotability because it reflects more on the person she wants to be and she would rather choose happiness over doing things that will be favorable to her career.

And I now, I am prioritizing things I believe in over promotability and I know that I am taking the risk of taking longer to get promoted and I am, I'm not happy about it but I'm doing it because it's the person I would rather be, to have time to be with my kids or go to their school or help a student versus write a paper. I mean I'm still trying to write a paper (laughs) but um I'm making, I'm making decisions that are not necessarily always favorable to my own success if I think they're the more important thing to do. And they overlap service, my personal life and being more than, more than research. So I guess that's a, I wouldn't say it's a strategy 'cause it's not a good strategy for myself but it is a strategy for happiness and hopefully sort of long term success or something.

For example, it is very important to her to mentor and advise women students. Carol’s choice to go into a STEM field is directly related to a female faculty member at her undergraduate institution.

I don't think service ever really gets you promoted but I think that, that I was able to show in very substantive ways that I had a a real impact on women in the field, especially women graduate students and some of that was service and some of it overlapped with research. So for example I have helped women apply successfully for prestigious external fellowships and to complete their degrees and nurture them through the process. And I have an undergraduate research student that I was able to nurture through doing research
at Lehigh, going to graduate school. I didn't help her through grad, graduate school but she, getting started with me, she is now about to start a faculty position. She is very successful in our field and she got her start here. So kind on a small numbers but real substance I was teaching students outside of the classroom.

Kelly is making tough choices with respect to her service work and her promotability as well. Kelly consciously chose to turn down external service work in lieu of internal service work, which has shown to not be as valuable in the promotion, tenure, and reappointment process.

I've had to be very, very cognizant and- and aware, and um, I- I turned down an opportunity recently to be reelected to my professional society's executive board. Um, and I thought long and hard about it. And, you know, the- the current president, he was, "But [Kelly], you know, do this. You know, this is- this is- this is good for your future promotion, and, and um, you know, it's what helped get you tenure." I'm like, I understand, but I don't want to do it if I can't do a good job. And um, you know, I felt at that point I was way too overburdened with things that needed to happen on campus here.

**Impact on research**

Impact on research is another sub-theme that was unique to the associate professors. Kelly is experiencing the need to consciously make hard decisions with respect to the amount of time she spends on service work as opposed to time on her research. She has decided to focus more on her service work and to not put as much energy into her research. In discussing how many research proposals she submitted last year, she said the following:

Um, I submitted four papers last year. My- my dean wants me to be publishing five or six a year. Um, great. Great, that's awesome. Um, I submitted twelve grant proposals last year. One got funded. Thankfully, it wasn't a major grant. But I have to be able to secure
research funding, and as you know, that takes time. It takes an immense amount of time, and an immense amount of mental energy. And, um, it's a choice that I've made.

Surprisingly, Kelly was happy that she did not receive a major grant as it would take up too much of her time. This is not the typical response for a researcher, especially one who is trying to earn the rank of full professor. She acknowledges, however, that this is a conscious choice that she is making and that she would prefer to limit the amount of time she is spending on research so that she has more time to spend elsewhere – specifically service.

Carol shares similar sentiments as Kelly regarding the fact that the amount of time she spends on service has definitely hurt her research productivity.

Carol: Um I think that research is the area that suffers the most because it's the easiest one to sort of do later.

Researcher: Okay. So then do you feel you had to adjust your natural tendencies on how you spend your time specifically on service work in order to progress through rank?

Carol: I just work more. I mean, I, I work on weekends. I work on nights. When I had a new baby I paid a babysitter to come for a large chunk of the weekend so I could work on my research over the weekend. Um I, I, because at that time I was pre-tenure. (laughs) And I, I think that's the main, the main thing if the research is gonna get done I have to do it on my own time.
Research is an incredibly important component of the work that is done by members of faculty, but in choosing how to manage her time Carol admitted that her research was something she pushed off until a later time as it is the type of work that doesn’t have as hard of a deadline as her teaching and service responsibilities. Carol runs out of time during her typical work day and week to accomplish all of her research, teaching, and service, so some of her work, namely research, spills into her personal/family time. What is ultimately happening is that Carol is sacrificing some of her family time in order to do the service work she finds valuable.

Protection from service work

The next sub-theme discusses protection from service work. In Theresa’s experience, the department chairperson takes on the responsibility of ensuring the time of new members of faculty is focused on activities that will help them earn tenure.

I think though the faculty, the senior faculty and the chairperson kind of shields the per, shields the junior faculty from very, um, time consuming or onerous committee tasks. And this would regardless if they were male or female, because they know that they've got a lot to get done. And the tenure clock is clicking, and so on and so forth.

Kelly and Carol’s experiences were quite different from what Theresa describes in that neither of them were protected from any service burden. Carol did add that her male counterparts were not protected any more or less from the service burden than she was at the time.

Kelly is adamant about actively protecting those who come after her. Even though she was not protected from service burden herself, she wants to change that for her younger colleagues. She shared a story about a time when her department chair was looking for someone to participate on a committee and wanted an Assistant Professor representative:
Um, our dean at the time was very keen on ensuring that there was um, female representation on all of these committees. Um, but he also wanted female representation at all ranks. And um, while, again, I was already, I was leading one of these committees, I had already agreed to that. Um, I sat down with him and he said, "Well, what about this person?" And I said, "Junior faculty member, needs to work on her research." "What about this person?" I said, "Junior faculty member, needs to work on her research." And um, I provided, again, I provided them with the level of protection that I never really got.

Kelly ended the story by saying she ended up the only female to serve on that committee and felt good about being able to protect her co-workers.

**Institutional practices requiring female representation**

The final sub-theme under Service Burden discusses Lehigh’s practice of “requiring” female representation on various types of departmental, collegiate, or institutional committees. This is the practice is in place for search committees of faculty positions in STEM fields. Unfortunately, since there are so few female members of faculty in the STEM fields at Lehigh, this practice puts a burden on the same small population of women to serve over and over while their male counterparts are not called upon with the same frequency. This one is a double edged sword because it is important to have diversity and inclusion during the hiring process.

Carol reflected about other ways to alleviate this burden by saying, “…but I also think it would be good if men, more men, were able to think about diversity and inclusion issues without being the underrepresented population and so it's frustrating.” She also expressed her “extreme frustration” in being a token female. Theresa shared that during her time when she was going through the promotion, tenure, and reappointment process, requiring female representation on committees was not the practice.
Back in my day, no, no, we was, I don't think there was [consideration of diverse representation on committees], I don't think, and in fact, I wouldn't have like it actually, if I had been put on a committee just because I was some kind of token woman or something.

**Conclusion**

The women in the study are experiencing difficulty in saying no to requests for time on service work when it comes from a superior, especially for junior faculty members. In theory, it is easy to suggest simply to say no to the requests; unfortunately it is not that simple. One of the full professors commented that the department chairs are aware of protecting pre-tenured faculty members from too much service, yet those still going through the process in the study say they have not been protected and are overwhelmed with the burden. There is the mindset of protecting those who come after and mentor the young faculty members to release any guilt they may feel.

There are some practices in place within the institution that exist with good intentions, such as the requirement to have female representation on all faculty searches in STEM fields. A side-effect of this practice results in the smaller population of female faculty members in the STEM fields experiencing extra service burden.

**Promotion, Tenure, & Reappointment Process**

The next superordinate theme with the second most number of comments is the Promotion, Tenure, and Reappointment Process itself. This is the process that is followed when members of faculty progress through academic rank. The typical promotion, tenure, and reappointment path at Lehigh University is as follows:
Table 3

Promotion, Tenure, and Reappointment Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Promotion, Tenure, and Reappointment Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Hired at rank of assistant professor</td>
</tr>
<tr>
<td>1</td>
<td>annual review</td>
</tr>
<tr>
<td>2</td>
<td>first reappointment</td>
</tr>
<tr>
<td>3</td>
<td>annual review</td>
</tr>
<tr>
<td>4</td>
<td>second reappointment</td>
</tr>
<tr>
<td>5</td>
<td>annual review</td>
</tr>
<tr>
<td>6</td>
<td>promotion to rank of associate professor with tenure</td>
</tr>
<tr>
<td>9</td>
<td>triennial review</td>
</tr>
<tr>
<td>12</td>
<td>triennial review</td>
</tr>
<tr>
<td></td>
<td>promotion to rank of full professor</td>
</tr>
</tbody>
</table>

The researcher found two sub-themes under Promotion, Tenure, and Reappointment Process, the first of which was the women faculty members felt that the promotion, tenure, and reappointment process was definitely harder for them as a women. They feel they were held to a higher standard and critiqued more thoroughly than their male counterparts. After earning promotion to associate professor with tenure, and now reviewing tenure cases herself, Kelly feels that she has proof that her experience was much harder as a women compared to the men going through the process.

The second sub-theme under Promotion, Tenure, and Reappointment Process was women faculty members experiencing a longer length of time at each rank as they progress in their academic careers. Three of the four women in this study have experienced a longer than normal amount of time at one rank or another. The women who are currently at the rank of associate professor with tenure both spent more time than the standard six years at the assistant professor rank. Each of them say their service burden contributed to the length of time of their rank at hire, but it was not the sole reason. They each had other factors that played into the need for extra time. Maryanne, currently a full professor, spent more than the average time at the rank of
associate professor with tenure. Only one participant in the study, Theresa, spent less than average time at both the assistant professor rank and the associate professor with tenure rank before she earned the rank of full professor.

**Harder for women**

The participants in the study shared that their experiences with the promotion, tenure, and reappointment process are much harder for them as female members of faculty as compared to their male counterparts. Here are what the participants said when asked if they felt the promotion, tenure and reappointment process was easier, harder, or no difference due to being a woman:

Maryanne: I think it was harder. A lot more- a lot harder. The reason being, I felt I was being scrutinized, uh, more. Asked more detailed questions.

Kelly: It was much harder. I was held to a much different standard. Much different standard. Yes. And having evaluated tenure packets at this point in my life, I was held to a much higher standard. (laughs) There is no doubt in my mind.

Carol: Um, well it's not easier. (laughs) I definitely think it's harder because I think that, I'm not sure that I whether I need to be better than other people. I think the process tries to be fair but it's harder to do the more meaningful things if you are doing a lot of service. I don't mean more meaningful I mean more rewarded. It's harder to do enough of the more rewarded things.

Not only do these women feel the process was harder for them as a woman, they believe they have proof to support those feelings now that they are a part of the process from the other
side as committee members for those who come after them. The women can see how the male faculty members are measured as compared to how they were measured. They feel strongly that they were not and are not treated the same as their male colleagues, but they are also resigned to this being the case.

**Length of time for promotion**

The associate professors in this study experienced a longer timeframe at the assistant professor level than the standard six years to earn the rank of associate professor with tenure, though they each had logical reasons as to why it took them longer. Carol mentioned that in her case, the amount of service work in which she was participating has definitely impacted her ability to earn promotion, but that it was not the only factor. Carol decided to start a family in that same period of time. When sharing this with the researcher, she said defensively, “Uh, I had two kids pre-tenure so that's why it was seven years and also I, I took a leave. I took two leaves but I only took one tenure extension.”. Kelly’s research was ruined twice in consecutive years due to power failures caused by extreme weather. The two associate professors in the study were defensive regarding the amount of time it took them to get to their current rank. Kelly wondered whether or not she will ever earn the rank of full professor.

Um, now, in terms of getting promoted to full professor, I don't know if it's ever going to happen. At the rate that I'm going, my institution is going to have to change the way they think about promotion. And, right now, it is all about um, you have to be a demonstrated leader in your research field. You have to be internationally recognized in your research field. There's very little um, consideration for being a leader and a competent administrator um, at the current institution.
The length of time for promotion varied for the full professors in the study. Maryanne took the standard six years to earn the rank of associate professor with tenure, but remained at that rank for longer than the standard number of years until she earned the rank of full professor. Maryanne sounded a bit incredulous when she commented that she thinks the amount of time she was at the rank of associate professor is the longest amount of time that anyone has experienced before earning promotion to full professor. She made it sound as though the time she spent attempting to earn the rank of full professor was something she simply had to endure.

Theresa is the only one in the study who was promoted to the next rank in less than the standard amount of time. This is the case for both of her promotions – from assistant to associate with tenure as well as associate to full. Theresa said very matter of factly, “I, I mean. Yeah, I'm not sure that I did anything in particular that was specific to be, me being successful as a, uh, woman faculty member.” Theresa’s experience with the promotion, tenure, and reappointment process was much different than those of her colleagues in this study. She didn’t seem to be affected by the same types of issues the others experienced. In responding to the researcher’s questions she made it sound as though the promotion, tenure, and reappointment process was algorithmic and she just followed the path, which led to her success in earning the rank of full professor.

Conclusion

As women faculty members in STEM fields progress through academic rank, they are finding that their experiences with the promotion, tenure, and reappointment process typically longer than those of their male counterparts. There may have been some other factors at play as well in the amount of time it took some of the women to earn promotion to the next rank, but not for all cases. The women in the study also learned, once they made it to at least the rank of
associate professor and earned tenure, that their experience with the promotion, tenure, and reappointment process was tougher than their male colleagues in that their work was critiqued, questioned more, and held to a higher standard than the male faculty members who are going through the same process.

**Value of Service Work**

The next superordinate theme is the value of service work in the promotion, tenure, and reappointment process. The meaning of the value of service work is whether or not service work carries any weight or provides any positive impact during the promotion, tenure, and reappointment process. The researcher found four sub-themes in the area of value of service work. The first sub-theme is that service work has little value during the promotion, tenure, and reappointment process. Theresa mentioned that service work has little value during the promotion, tenure, and reappointment process, especially for those at the assistant professor level.

The second sub-theme that emerged is that the value of service work is in the eye of the beholder. Service work having value in the eye of beholder means that regardless as to whether or not service work provides any value during the promotion, tenure, and reappointment process, those that performing the service work believe the work they are doing is important. All four of the women agreed that there is value in service work to the individual person performing the work. The participants felt more value in the service work they do when it is important to them, or they take leadership roles in the service work.

The third sub-theme is that service work is viewed as something that just needs to be done – the box needs to be checked. Kelly was flummoxed that activities that require 20% of her time as a member of faculty garnered only a single line in her promotion letter. Maryanne does
not think that her service work was valued while she was an associate professor with tenure or else she would not have held that rank for as long as she did.

The fourth and final sub-theme that was found under value of service work is the view that external service work, such as involvement in their respective professional committees, holds a much higher value than internal service work to one’s department, college, or the University. One participant even shared a story to convey the value of this type of service work. A colleague of hers who served as president of his professional society was able to obtain a teaching release during his term. This type of external service work is not only valuable to the promotion, tenure, and reappointment process, but also to the individual themselves in that it helps raise their profile within their field and ultimately helps with research and papers.

**Service Work Did not Contribute Towards Promotion**

Another topic in which all four participants agree upon is on whether or not service work contributes anything towards promotion. They are all in agreement that in their experience, service work has very little impact on earning promotion to the next academic rank. Theresa said that nothing about her service work was critical to her earning either of her promotions or tenure. Carol simply states “I don't think service ever really gets you promoted.” Maryanne’s experience validated that of Theresa by saying:

I seriously don't think my service contributed to my tenure and the promotion decision.

Otherwise, if it had (laughs), it wouldn't have taken x [omitted to retain anonymity] years for me to get promoted to full professor, because x [omitted to retain anonymity] years is one of the longest periods that, uh, that I know women have- any faculty have experienced for, for promotion.
Kelly was a bit more perturbed than the other participants by the fact that service work has little value in the promotion, tenure, and reappointment process. She shared that students approach her for help with their issues and she takes the time to mentor them and provide guidance. This type of work is time consuming, yet it is neither recognized as valuable nor is the time spent acknowledged. Kelly says that even though she is spending more than her allotted 20% of time on service work, it “got all of a line” in her promotion letter.

Researcher: Okay. Okay. So then, can you share your thoughts on whether or not you think service work is valued during the promotion tenure and reappointment process?

Kelly: Absolutely not. (laughs) Um, I think it was a one-liner in like one of my reappointments.

Researcher: Okay.

Kelly: And, she served on two search committees. Yay! Um, that was you know, basically it. Um, and then the rest of it was all about you know, research, which is super important. Um, you know with like half a paragraph about education and then one sentence about- about service. So even though my service responsibilities were most certainly taking up the portion of my time that is written in my um, appointment letter, so we have a forty forty twenty system. So forty percent research, forty percent teaching, twenty percent service, I was certainly doing my- my twenty percent service. Um, but it, you know, got all of a line somewhere
Theresa said, “I don't think now of anything in particular about my service work, which was critical to my earning, um, promotion.” She also had this to say, agreeing with what was shared by Kelly, “But I would say in terms of the weighting, um, it would quite low, especially at the assistant professor level.”

Even though all four women in this research study agreed that service work does not help in the promotion, tenure, and reappointment process, the associate professors still feel passionate about the type of service work they do and they do not appear to have any plans to adjust how they spend their time to decrease the amount of service to have time to focus on other things, such as their research.

**Value is in the eye of the Beholder**

The women in the study spoke about service work being of value to the individual faculty member, regardless of the its value in the promotion, tenure, and reappointment process. Theresa was confident in her belief that service work has value to the individual doing the work. She continues saying,

I think when you do service work, and you put it on your resume, I mean there's a lot of things. You want to be able to do something you're interested in. And also I suppose you'd like to do some kind of service work which is meaningful and where you have some real input into what's going on. In other words, you're sort of leading the service work rather than perhaps just doing something where you turn up and sit at meetings.

Along these same lines, Carol mentioned a few times how important it is to her to mentor female students. When asked if she thought service work service work was valued during the promotion, tenure, and reappointment process, she said, “I think it's valued but I don't think it's
valued at the level of the substance that um that I did, especially service like mentoring uh women students.” Even though this type of service work has little value in the promotion, tenure, and reappointment process, she values it much more.

Kelly shared a story of when someone from another institution showed interest and recognized her passion for internal service work, and was courting her for a faculty position at their institution. She said,

What is going on? (laughs) Is there some strange world out there that I didn't know existed. Um, it's- so- but it was one of those moments that, you know, you- you get to say, oh wow, I- I don't suck. Um, wow, you know, I am doing good things, even though it often feels like I'm just drowning. Um, in things that are not related to what anyone thinks is important. Except for of course me.

The women in the study realize that the type of service work they are doing is important to them, and they understand that they are sacrificing promotability at Lehigh University since they are aware that service work is not as valued during the promotion, tenure, and reappointment process at this institution. One participant, Kelly, did learn, however, that things could be different at other institutions, though she did not sound interested in the opportunity. Her reflection on this was, “oh wow, I- I don't suck. Um, wow, you know, I am doing good things, even though it often feels like I'm just drowning.”

**Service Work is Just Something That has to be Done**

Maryanne, Theresa, and Carol all viewed service work as just something that has to be done. Even though many of the participants had strong beliefs regarding the value in the service work they performed, they also had no qualms or misunderstandings that many viewed service
work only as a requirement that must be completed. Maryanne used phrasing of “check the box” more than once when describing her thoughts on the value of service work.

Uh, in the right time, it appeared that there was a certain percentage on it, uh, but again, reality and casual conversations with, with senior faculty and, uh, and even department chair, uh, it was obvious to me that I just needed to check the boxes, and they really didn't care too much, uh, of it.

Theresa concurred and said very matter of factly, “it has to be done.” Carol stated that while there is some service work is not put on one’s official list of things that are done, you inevitably have to do it. Kelly is the only participant that did not describe service work as something that just has to be done as she views service work to the institution as integral to the continued improvement, success, and future of the institution.

**External Service Work Valued More Than Internal Service Work**

Maryanne, Theresa, and Kelly all mentioned that they felt that external service work to one’s professional organization is valued more during the promotion, tenure, and reappointment process than internal service work to the institution. Maryanne shared this:

Uh, but service outside the department, outside the university seemed to carry more value, and, uh, that's what I concentrated on at the time, particularly after tenure, uh, during the, uh, well, first few years as an associate professor, I did concentrate on that side, so it's sort of organizational, uh, committees and professional organizations and so on so forth.

Maryanne viewed her external service work with her professional organization as more valuable when going through the promotion, tenure, and reappointment process not in that it is viewed more highly by the promotion, tenure, and reappointment committees, but that it helped
her professionally with her research, helped her make more of a name for herself in her field, and therefore, helped her to publish more of her work. When asked what she felt she did specifically with regards to service work that made her successful in earning your promotions if anything, Maryanne shared her experience:

Uh, again, the outside service, not university service. I'm not- I don't know if university service would have, uh, influenced or affected promotion and tenure, at least in my case. But outside service, uh, having served as chair of certain committees, professional committees, professional organizations, things like that, I think that gave me, uh, professional exposure. Uh, later on, uh, it helped me with, uh, with my research, with my publications, because I was, I was known, uh, to some of these other members in the community, which were all in the same area as I was.

Kelly acknowledged that service work to one’s professional organization holds more value during the promotion, tenure, and reappointment process. She shared a statement her professional board’s president made to her when discussing her decision to not continue on the board for their society, “You know, this is- this is- this is good for your future promotion, and, and um, you know, it's what helped get you tenure.” This is no different from what Maryanne experienced. This statement alludes to the fact that being on the board of one’s professional society carries more weight and is viewed more highly in and of itself during the promotion, tenure, and reappointment process.

Conclusion

The women in the study all agreed that service work did not contribute towards their promotion. They felt that during the promotion, tenure, and reappointment process it was just
was something that just had to be accomplished in order to check the box that service work was done. It was made clear by the participants that external service work did have more value during the promotion, tenure, and reappointment process than internal service work.

One piece of information that came out of this research study that was not anticipated from the literature, is that women are performing service work that they, themselves, perceive to have value. It did not matter as to whether or not the work they were doing would help them during their promotion, tenure, and reappointment process, but they felt good doing it.

**Microaggressions**

“Microaggressions are the brief and commonplace daily verbal, behavioral, and environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial, gender, sexual-orientation, and religious slights and insults to the target person or group” (as cited by Sue, 2010). The researcher found three sub-themes under the topic of microaggressions. The first sub-theme will discuss the participants experiences with *other-ing* where they felt that they were called out for their differences and made to feel “less-than” others in their departments. The second sub-theme shares examples of when the women in the study experienced stereotyping by their colleagues. The third and final sub-theme that emerged was the lack of respect the participants feel when at work.

**Feeling other-ed**

Kelly and Carol were more vocal about sharing their stories of feeling other-ed. Their experiences include hearing comments such as “you go to those ADVANCE things” referring to Lehigh University’s programming funded by National Science Foundation’s ADVANCE grant to increase the participation of women in academic science and engineering careers have been made to both of them. Comments such as “you’re from…” some specific geographic region,
“you study…” a different area of research, “you’re focused on education and not research” are other examples of other-ing they experience.

The women are experiencing that they do not identify with many of their colleagues in their departments. Carol went as far as to say she did not think that would be the case if she were not a woman and shared this story as an example:

Um so an interesting experience that I've had is that when I first started dating my, the guy who's now my husband, and I started taking him to events, he can talk to and relate to all of my male faculty colleagues better than I have even if I've known them for years and working with them for years. And in one case, this issue is maybe going away now a little bit, but in one case I have known the person for 25 years and then so it would have been 10 at the time. Um and so you know they meet my husband and they're immediately friends.

Carol was hurt by this experience. She truly could not understand why she could not have the same type of immediate connection with her colleague after so many years as her husband had made in one evening. The fact that these experiences are not logical may be what is so challenging for Carol and the other women in the study to accept. Those who are in STEM fields are accustomed to cause and effect, and these experiences do not follow this model.

Maryanne and Kelly both have the conception that their male colleagues do not think highly of them as faculty members. Maryanne shared “… then later on, uh, I felt very much, uh, uh, uh, not, not being able to, um, uh, to come up to the expectations of some of the faculty, no matter what I did and how I did it” while Kelly said that she “is used to being told she’s not good enough.” These statements imply that these women feel they are not a part of the team within
their departments. In another clear example of when she felt other-ed by a colleague in her department, Kelly shared the following story.

[A colleague said] Um, that I never have to worry about my- my- my service load because you know, I'm way over here. And I'm just- I just looked at somebody. I said, "Well, what- what does that mean?" They're like, "Well, that you don't really count in the department because you're way over here." "What? (laughs) What do you mean I don't count in my department?"

Kelly was outraged when she shared her colleague’s words that she “didn’t really count in the department.” Kelly really wants to identify with her colleagues and wants to feel that she belongs to the group within her department but she finds that she is often other-ed with interactions such as this.

The participants experienced times when they were identified as different from the remainder of their colleagues in their departments. Being a woman in a STEM field, they are accustomed to these experiences, but that does not mean it does not affect them or make them wish they could experience their professional lives differently.

**Stereotyping**

Another way in which these women have experienced microaggressions is in the vein of stereotypes. Maryann was typically pretty mild mannered throughout the interview and thoughtful in her responses. When asked to share any experiences of when she thought she was stereotyped within her department or college based solely upon her gender, she responded very quickly.

Oh. Oh. Yeah, yeah. I was definitely stereotyped, uh, for the, for the first half of my career I would say (laughing), uh, until I was promoted to, uh, full, to the rank of full. Uh,
the, as a junior faculty I was, I was an anomaly, or I felt that the rest of the faculty in the
department saw me as an anomaly…. Uh, they seemed to have some very pretty, uh, uh,
pretty formed ideas. Um, uh, but later on I, I sort of came to terms about these things, and
I felt a lot more at ease, and that's when I started to make headways in my career.

Maryanne perceived that her male departmental colleagues stereotyped her for quite a few years
by viewing her as an “anomaly” and having pre-conceived notions about her abilities. Looking
back on this time, she identified a change in her mindset which helped her move beyond this
handicap and allowed her to progress through her career.

Carol provided some examples of the typical stereotypes members of an out-group have
to endure.

And uh the same person calls me by the secretary's name and the one other faculty
member's name and it's very annoying. And there's there's actually two, yeah, but you
know, there's 14, 14 male faculty members and people generally don't look them up and
there's only two or three women faculty members and this guy in particular, but other
people sometimes, just sort of lump us all together. We don't look alike. We don't act
alike. It's, it's you know, offensive.

This type of stereotyping puts Carol in a difficult situation in which she must correct or remind
her colleague of her name. Unfortunately for Carol, the person who is calling her by another
woman’s name is her department chair. In viewing the situation through Carol’s eyes, it is not
hard to imagine that she could feel her career is in trouble or that she has little chance to progress
through academic rank when the person who is supposed to support her in this endeavor, her
department chair, does not know her name.
Lack of respect

One of the participants shared that her grandfather was an engineer and that he was the reason she decided to go into a STEM field herself. “My grandfather was really smart. People respected him. That's when I knew I wanted to be like him.” This same participant later shared this story:

So, my department every year, my … department, um, has a- has a banquet. And, this banquet is mired in, I think at this point sixty years of history. And, historically, the banquet has featured um, skits. So, faculty roast students, students roast faculty. Um, the whole thing is- is entirely inappropriate. (laughs) But it is, it is a tradition. And my very first year here, um, the graduate students decided that it would be hysterical if they put my face on a lingerie model. And made the joke about me getting my job because I was a very attractive female who wore skirts. (laughs) So, yeah. That was fun.

This female faculty member experienced an awful situation in which she was clearly identified and made the butt of a joke for being a woman and therefore different from the rest of her colleagues. Though this happened years ago, the little, sarcastic laugh at the end of her story when she said, “So, yeah. That was fun” seemed to the researcher that it was far from fun and that this faculty member still feels humiliated. When thinking about it from the perspective of this faculty member, it is easy to imagine how disheartening this was for her. She was in her first year as a faculty member after many years of hard work to earn her Ph.D. in a STEM field, only to join the professoriate and to be told the only reason she got her job was because she looked good in a skirt. This woman chose to go into a STEM field because she sought the same respect her grandfather got from being smart, yet when she started her career as a faculty member, she received the opposite by getting publicly disrespected.
The women not only want respect as a person, but also as a knowledgeable and hardworking colleague. Another participant shared this story: “at the time of the tenure, one of the remarks that the, that the department made to me was that how could I have done all these things? You know? I-I'm clearly not a super, super woman.” This put her in a situation in which she had to defend herself due to her colleagues’ doubting the veracity of the volume of work she had done.

Another way in which participants are not getting respect is by their need to fight to be heard. One mentioned that she typically gets talked over in meetings by her male colleagues. Another shares this,

…my personal experience is you can't get a chance to talk in the meetings unless you interrupt or raise your hand and then raise your hand again and then raise your hand again and then they call on all the men first and eventually you may [or] may not get a chance to talk.

This participant views being treated in this manner as being disrespected, especially since this is not an unusual occurrence for her in her department. These microaggressions add up and can cause the women to not be as interested in their work, their careers, or the institution in general, resulting in lower work output. Again, this is another factor that can affect their ability to progress through academic rank.

… I work well when I'm excited about what I'm doing and I don't work well when I'm depressed and knocked down. And so you know when people said I wasn't doing a good enough job or I was doing an average job or you know, if I got a grant rejection. I, I don't thrive under that situation so I definitely applied for fewer grants when I was feeling
negative about Lehigh and I would say that was a period of more than five years. And I’m, I feel like I’m coming out of that, at least for a time. (laughs)

What this faculty member is experiencing here is known as low organizational citizenship. She feels like she has to work harder than her colleagues but is not receiving the same amount of respect resulting in her feeling that she is being constantly “knocked down.” This can ultimately affect this faculty member’s career in that she gets depressed and down from the constant struggle causing her to have a “why bother” attitude. A “why bother” attitude does not earn someone the rank of full professor.

Conclusion

Kelly’s words sum up the topic of microaggressions very well. She said, “…not all academics are created alike, but that doesn’t make us unequal.” The women in this study shared various stories of their experiences with microaggressions ranging from not identifying with their colleagues and feeling other-ed to being “lumped together” with other women in their departments to a basic lack of respect. These experiences frustrated and demoralized the women faculty members. Their jobs are tough enough without the extra pressure of needing to fight to be heard or taken seriously. One woman in the study shared how this has affected her mentally and that was negatively affecting her feelings about Lehigh University which caused a lower work output.

Men and Women Members of Faculty do Different Type of Service

While all of the women stated that male and female faculty members do some of the same types of service work, they definitely focus on and prioritize different types of work. The women in the study commented that men tend to focus more on external service work and work that is more focused on their research interests. As was discussed in the Value of Service Work
section of this paper, it was determined that external service work to professional organizations holds more value during the promotion, tenure, and reappointment process.

More than one of the women in the study stated that they are choosing service work that is meaningful to them regardless as to whether or not it is helpful during the promotion, tenure, and reappointment process. The type of work that the participants choose to do are more internal to the University, their college, or their department. It is perceived that in order to be involved in and perform the type service work they find worthwhile and is important for them to do, they will have to choose to either stay at the rank of associate professor for a really long time before they can earn the rank of full professor, or to give up the dream of never earning the rank of full professor at all. For example, Carol chooses to spend time advising and mentoring female students to make a long term impact on the number of women in STEM. She says that her male counterparts do not do as much student mentoring as she does, especially when it comes to female students or first generation students. Maryanne was involved with growing some of the exchange student programs as that was of interest to her and lined up well with her own experiences. Kelly spends a lot of her time on administrative work for the department and the University as a whole. When asked about the types of service work in which her male counterparts participate, she said,

Yeah, and when I look at my- at my colleagues, um, at my current rank, um, my male colleagues are again, maybe serving on an external board that's directly related to their research interests. Uh. I mean, I don't think any of them serve on major academic committees. Um, major, you know, policy committees.

When sharing this story, Kelly sounded as though she simply did not think it was right that more of her male colleagues were not more involved on various administrative committees. She is
passionate about the administrative work that she does and sees the administrative work as necessary to keep the wheels of the institution moving. A natural thought for her would be if more faculty members participated, then they could share the burden than to put it all on the shoulders of a few. Even though Kelly and Maryanne have both done work with their professional societies as a part of the executive boards but they both have done significantly more internal service work.

**Conclusion**

The women in this study believe that male faculty members do different types of work than female faculty members. The thoughts are that their male colleagues focus on the type of service work that is more directly related to their area of research interests while the women, themselves, do the type of service work they find personally valuable which ends up being more institutionally and student focused. The type of service work on which men choose to spend their time, has more value in the promotion, tenure, and reappointment process.

**Conclusion**

The purpose of this IPA study was to understand how women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion tenure, and reappointment process with respect to their service work. Service burden is a phrase used by faculty members to describe how they are overextended with institutional service work that is taking time away from their other responsibilities, especially research. Service burden was especially real for those who were still at the rank of associate professor. One reason these women may be experiencing service burden is the institutional practice of requiring female faculty member representation on various campus committees, e.g. search committees.
The participants of this study feel that their experiences with the promotion, tenure, and reappointment process were harder for them as women, compared to their male counterparts. In their experiences, they were more heavily critiqued, questioned more, and held to a higher standard than men going through the same process at the same time. The women feel they have proof that the male faculty members have it easier than they did because now that they are on the committee side of the promotion, tenure, and reappointment process for those who come after them, they can compare their experiences.

The participants found that different types of service work held different value during the promotion, tenure, and reappointment process. For example, the women experiences showed that external service work to one’s professional organization holds more value during the promotion, tenure, and reappointment process than internal committee work. When performing external service work to their professional organizations the women explained that they were more well known in their areas of study which ultimately helped them with their research and publications, which are also valuable during the promotion, tenure, and reappointment process. The external service work to the professional organization resulted in the women experiencing the value twice over for their single effort of that external service work – once in that it was valued more during the promotion, tenure, and reappointment process and once in that it helped them with their research and publications. The women realized there is also a personal value in doing the type of service work in which they were passionate, regardless as to whether or not it would help them during the promotion, tenure, and reappointment process.

Microaggressions are something else the women have had to or still experience within their departments. Microaggressions can be comments or actions that marginalize an underrepresented population. The women in this study are in the minority in their academic
departments with respect to gender equity. Though they may be unintentional, these women are then also experiencing situations in which their differences are either highlighted to show how they do not fit in with the rest of the members of the department. These microaggressions make it harder for these women to find others with whom they can identify, making them feel more alone. This can have a negative effect on the women’s mental health, on their productivity, and on their team’s productivity.

The women in the study have also realized that their male counterparts participate in different types of service work than the women themselves perform. In the women’s experiences, their male colleagues tend to focus more on the external service work to their professional organizations while the women tend to do more internal institutional service work. Due to the fact that the type of service work on which the women are spending their time is not as valued during the promotion, tenure, and reappointment process, they are experiencing that it is taking longer for them earn promotions and are concerned as to whether or not they will ever earn the highest rank of full professor.

The next chapter will review these findings with respect to the theoretical framework selected for this study, Henri Tajfel’s Social Identity Theory. It will also discuss how these findings fit within the existing literature on the topic as well as discuss recommendations for current practice and future research.
Chapter Five: Discussion and Implications for Practice

The purpose of this study was to understand how women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion, tenure, and reappointment process with respect to their service work. This qualitative Interpretative Phenomenological Analysis study utilized Henri Tajfel’s Social Identity Theory as the theoretical framework. Tajfel’s Social Identity Theory outlines preferentialism for those in the in-group, while discriminating against the out-group (Taylor, Fiske, Etcoff, & Ruderman, 1978). The double hermeneutic of Interpretative Phenomenological Analysis allowed the researcher to make her own interpretations of the participants’ sense making of their experiences.

The reiterative analysis of the four transcripts yielded five superordinate themes each with their own set of sub-themes. The superordinate themes are as follows: Service Burden; Promotion, Tenure, & Reappointment; Value of Service Work; Microaggressions; and Men and Women Members of Faculty do Types of Service Work. The remainder of this chapter will discuss how these findings align with the existing literature on the subject, followed by recommendations for current practice. The chapter will conclude with recommendations for future research.

Service Burden

Service burden was the superordinate theme with the most references among the four interviews. At Lehigh University, the default breakdown of how members of faculty should spend their time is teaching at 40%, research and scholarship at 40%, and service at 20%. While those participants who already held the rank of full professor thought 20% was an active representation of the amount of time they spend on service work, those participants as the
associate professor level both claimed they spent significantly more than 20% of their time on service work.

Women faculty in STEM fields at the rank of associate professor experienced much more service burden than those at the rank of full professor. This is consistent with the findings by Mamiseishvili et al. (2016) in that they say that mid-career faculty devote the most time, as compared to other faculty ranks, to service activities of all types, including service to the institution and to their professional organizations. Women faculty members who hold the rank of associate professor spend many more hours on service work than male faculty of the same rank (Misra et al., 2012; Neumann & Terosky, 2007). Misra et al. (2011) state that women faculty members spend about 25% of their time on service work, while their male counterparts spend about 20% of their time on service work.

Women who hold the rank of assistant professor shared their experiences of needing to make difficult decisions on how they spend their time and how much time they will spend doing the service work that is important to them as opposed to maintaining a high-level of research. They are making conscientious decisions as to what is more important to them in the big picture of the institution as a whole and their fields, rather than just focusing on their individual need to progress through rank. The reality has set in for these women that the choices they are making to not prioritize their research as highly as some of their other work may impact their promotability. As one person said, all the service work they are doing earned one line in their promotion letter from the rank of assistant professor to associate professor. This is akin to a participant in Reybold & Corda’s (2011) study who felt “overused and undervalued” (p. 138).

All of the women in the study mentioned that it is hard to say “no” to a request to perform service work when it is coming from a superior. Even though it was suggested to simply
“say no” if you’re being asked to do too much service or you don’t want to do it with a good reason. Admittedly, the ability to do this is much easier as a senior faculty member and how a junior faculty member may feel more constrained and feel they are unable to say no. This is consistent with Guarino & Borden’s (2016) statement that due to institutions of higher education being gendered organizations, men may feel more confident in saying “no” to requests for service as compared to women.

Passing along lessons learned to the newer faculty who join the professoriate is one way in which the women are trying to make it better for those who come after them and are preparing for the Promotion, Tenure, and Reappointment process by encouraging the newer members of faculty to only say yes to the service work that is truly important to them and to not feel guilty about it. This type of reaction is consistent with Neumann & Terosky’s (2007) findings in that new faculty may be protected from service burden in order to allow them to focus on their research as research has more value during the Promotion, Tenure, and Reappointment process. Something to note here is that these women at the rank of associate professor are sacrificing their own time and chance at promotion to help others.

In learning how the participants got their interest to study a STEM field, one person shared that her interest did not start until her second year of college when she had a female professor for a STEM course. This encouraged her, and some other female students, to continue taking STEM courses and ultimately choose STEM for their majors and careers. This experience is what Carrell et al. (2010) describe in their study. They found that female students studying in a STEM field having a female faculty member as an instructor has a positive impact on the likeliness of the student taking more STEM coursework, and graduating with a STEM degree.
Laursen et al. (2015) found that female undergraduate students are inspired by seeing women faculty members in STEM fields and they are more likely to want to do the same type of work. Mentoring students, especially female students, makes up a lot of the service work accomplished by women faculty in STEM fields. This is something they all feel strongly about and find a lot of personal value in doing, but also recognize the large amount of time it takes to do it and to do it well. Their male colleagues are not doing as much mentoring of students, especially for female and/or first generation college students. One participant, in particular, explained how her mentoring of female students is helping to increase the number of future women faculty members in her field, and she was proud of this fact. Gaule & Piacentini’s (2018) study found that women doctoral candidates in Chemistry who had a female faculty member as an advisor tended to be more productive during their doctoral studies and were much more likely to stay in academia themselves and join the professorate.

Women faculty members in STEM fields are not prioritizing as much of their time to research as they are service work. Research is the “easiest thing to put off until later” as one participant said. They are taking their own personal time on nights and weekends to work on their research taking away time from family. One participant admitted to getting a babysitter on the weekends to allow her the time and concentration needed. When specifically focusing on STEM faculty at a research-intensive university, the comparisons of faculty time by gender show that faculty work is gendered. The percent of time that is spent on research: 42% for men versus 27% for women (Misra et al., 2011). Guarino and Borden (2016), Eagan and Garvey (2015), and Vesterlund et al. (2014) all found that service burden is a serious issue specifically for female faculty members in that it is causing them to fall behind their male peers in terms of research
productivity, recognition, chances at promotion, compensation, and preventing them from advancing in academia.

It was brought up that the department chairperson typically shields junior faculty, both male and female, from onerous committees and other types of service work. The department chairs are cognizant of the junior faculty members’ time and try to minimize the amount of time spent on service work as they are aware of the fact that writing research proposals, papers, and supervising students is time consuming. This is consistent with the findings of Newmann and Terosky (2007). They found that at research institutions, new faculty may be protected from service work while being encouraged to focus on their research, as research carries more clout in tenure and promotion reviews. However, a different participant mentioned that she, herself, was the one protecting the time of the junior faculty when the department chair wanted more female representation on a committee saying they junior faculty needed to focus on their research.

Lehigh has some practices in place that “require” female representation on various types of departmental, collegiate, or institutional committees. This practice is in heavy use for search committees for faculty positions in the STEM subject areas. This practice is especially burdensome for the small population of female faculty members in STEM fields as they are frequently and repeatedly called upon to participate on these search committees. This is exactly what Guarino & Borden (2016) cite as one reason why women faculty members participate in disproportionately more service work than their male colleagues. Pyke (2011) cites this same issue by saying there is more pressure for the few women faculty in the higher ranks to serve on more University committees to keep the parity of gender equity. Hirshfield and Joseph (2012) describe what these women are experiencing being a token woman in committee meetings as identity taxation.
Not only are these women burdened by the extra service work requested of them to participate on various committees, but these female faculty members feel as if they are the ‘token’ woman in faculty and committee meetings. They are told or given the impression that they are not good enough, they are not respected as knowledgeable or productive colleagues, and they have to deal with being stereotyped. Working in this type of environment can cause these women to have low organizational citizenship, which in turn causes the women to not be as interested in their work, their careers, or the institution in general, resulting in lower work output. Again, this is another factor that can affect their ability to progress through academic rank. This has an effect on these women overall, not just hindering their careers, but also affecting their emotional health (Hirshfield & Joseph, 2012). The woman who is identified as the token in her work group may perceive that she is being discriminated against and feels her inputs are not heard or considered, her productivity will decrease (King et al., 2010).

There is irritation among the women faculty members in STEM fields that more men are not advocates for the underrepresented populations and that it is left up to those underrepresented populations to speak for themselves resulting in more of a service burden. Pyke (2011) suggests inviting men who are committed to gender equity to serve in their place at times. This will allow the women faculty members more time to spend on their research and therefore providing them a better chance to attain tenure and promotion.

Research has shown that diversity on campus and in working groups has fostered more ingenuity and creativity in problem solving. “Innovation within an institution is manifested primarily by the faculty” (Gialamas et al., 2013, p. 76). Hoogendoorn et al. (2013) showed that as the percentage of men and women becomes more equitable on teams, the sales and profits of that team increases as compared to teams with a heavy percentage of one gender or the other.
Promotion, Tenure, and Reappointment Process

Women faculty in STEM fields think the Promotion, Tenure, and Reappointment process was definitely harder for them as a woman as compared to their male counterparts. Not only do women faculty members have it harder from the perspective that the types of service work they perform is not as valued during the Promotion, Tenure, and Reappointment process, and that the amount of service work they are performing impedes their ability to devote enough time to their research which is helpful during the Promotion, Tenure, and Reappointment process, but they also believe they are “scrutinized more” than their male colleagues going through the same process. They feel their experiences have been confirmed now that they are a part of the tenure process and review the dossiers of assistant professors going up for Promotion, Tenure, and Reappointment. They are now able to see first-hand that that they were “held to a much higher standard.”

Service burden is causing the female faculty members in STEM fields to stay at the rank of associate professor longer than the average amount of time. One person even expressed, “it’s going to be a long time” before she will make it to the rank of full professor. Women faculty members are ten percent less likely to be promoted from Associate Professor to Full Professor than male faculty members, according to Laura Perna, a University of Pennsylvania researcher’s analysis of the National Study of Postsecondary Faculty (as cited by Misra et al., 2011). The amount of service work women faculty members are performing is causing them to fall behind their male peers in a number of ways but, preventing them from advancing in academia (Eagan & Garvey, 2015; Vesterlund et al., 2014). Something will need to change in the Promotion, Tenure, and Reappointment process to allow all members of faculty to have an equal chance to
earn the highest rank of full professor. Institutions should consider defining clear parameters for faculty members to achieve full professor akin to what is defined for tenure (Misra, et al, 2011).

The definition of service work has been called “nebulous” (Mamiseishvili et al., 2016, p. 274; Neumann & Terosky, 2007, p. 282), “difficult to define” (Lawrence et al., 2012, p. 325), and “ambiguous and insignificant” (Reybold & Corda, 2011, p. 121). Blackburn and Lawrence (1995) define service as “catchall name for everything that is neither teaching, research, nor scholarship” (p. 222). Since service itself is hard to define, attempting to have clearly defined criteria for service within the Promotion, Tenure, and Reappointment process is challenging and leaves room for the reviews to be more subjective than objective (Dyer, 2004). This ambiguity then causes an issue for the faculty member going through the Promotion, Tenure, and Reappointment process in that it may be hard for them to deliver what is expected without clear guidelines (Austin & Rice, 1998).

**Value of Service Work**

It is agreed that service work has very little impact on helping to earn promotion to the next academic rank. At many institutions, policies may exist stating faculty is rewarded for their service work, but in reality, service does not carry much weight in the promotion, tenure, and reappointment process (Jaeger & Thornton, 2006). According to Misra et al. (2011), service work is difficult to measure and is not as highly valued by promotion and tenure committee. Women faculty members in STEM fields may get to the rank of Associate Professor with tenure, but then struggle to earn the highest rank of Full Professor due to their service burden. Misra et al. (2012) says that service burden affecting one’s ability to earn promotion can be especially harmful to female faculty members, as it has been shown that women tend to do more service work than men.
Even though service work does not hold much value in the Promotion, Tenure, and Reappointment process, service work does have value to the individual person performing the work. There is value to the individual both professionally and personally. Service work is added to one’s curriculum vitae and can also allow one to be more well known in professional field. There is also value to the person themselves in that they know they are participating in something important that is bigger than themselves and doing something for the greater good.

It is important for institutions that are concerned about their diversity and inclusion efforts on campus to be cognizant of the small numbers of women faculty members in STEM fields from which to recruit. It ends up being a simple supply and demand situation. One participant shared that she was approached by someone at another institution to join their professoriate and tried to entice her by acknowledging her specific service work interests and explained that she would be valued for that type of work. When employees perceive they have the support of the leaders and the organization as a whole, and that those leaders and organization make a vested interest in the employees’ well-being, the employees identify with the shared goals of the organization more readily and have increased organizational citizenship which ultimately increases retention (Lawrence et al., 2012; Scott et al., 2016). Chang et al. (2016) identifies the fact that there are costs associated with retaining women faculty members in STEM fields who are being recruited by other institutions and say it could cost anywhere from 1.5 times the first-year salary up to $900,000 to recruit and train new members of faculty.

Guarino and Borden (2016) found that more of the women faculty members’ service work is in support of the institution, i.e. “taking care of the academic family” (p. 19). O’Meara (2016) says that women faculty members tend to do more internal service work in support of the University’s operation as suggested by social role theory in which women traditionally take care
of the home while the men are at work. Misra et al. (2011) and Misra et al. (2012) found that women tend to do more institutional/internal service work and men lean more towards professional service in their area of study. This service work with the professional organizations is considered more esteemed and therefore more valuable during the Promotion, Tenure, and Reappointment process. This behavior was exemplified in this research study in that one participant turned down an opportunity to be re-elected to the executive board even though she was told the position would be good for her career. She did this because she felt she would not be able to do a good job as she is too overburdened with things that needed to happen at the University. Another example of sacrificing what is good for her own career and promotability to do what she feels is right for the greater good of the students and the institution.

**Microaggressions**

Women faculty members in STEM fields are outnumbered by male faculty members in their departments. In this study, the researcher chose to speak with women faculty members where the percentage of tenured/tenure-track women in the department is less than 25%. This means these women faculty members only have one or two other female colleagues in their departments. “An institution’s most important asset is a diverse workforce in which the contributions of each individual are respected and valued” (Moses, 2012, p. 1). The information in this section mostly clearly identifies with the theoretical framework chosen for this study, Henri Tajfel’s Social Identity Theory, specifically in-groups and out-groups.

If there is a single woman in a work group, she has a higher likelihood of becoming a deviant or isolate (Wolman & Frank, 1975). The women in this study shared their experiences of when they felt other-ed by their colleagues and did not have anyone within their departments with whom they identified. These women feel isolated and alone at work. It is difficult for them
to make friends at work sharing the only time they will go to lunch with colleagues is if they extend the invitation themselves. King et al. (2010) describes this type of other-ed individual as a deviant. A deviant is defined as someone who may be ignored by the rest of the group and therefore their input is not heard.

There are other ways in which women faculty in STEM fields feel other-ed. Even though male colleagues are astute enough never to never say “because you’re a woman” as a reason that as for the difference between them, they used other characteristics such as area of expertise within their field of study, by they grew up, or the type of work accomplished within the institution. Sometimes they simply do not feel they can live up to the expectations of their male colleagues.

All of these types of comments are ways in which their male colleagues are pointing out how the women, the “out” group, are different from the men, the “in” group. How others perceive an individual based upon their own categorization of the other person into different groups is a part of Social Identity Theory.

Stallybrass’s (1977) defines a stereotype as “a over-simplified mental image of (usually) some category of a person, institution or event, which is shared, in essential features, by large numbers of people… Stereotypes are commonly, but not necessarily accompanied by prejudice, i.e. by a favorable or unfavorable predisposition toward any member of the category in question” (as cited by Tajfel, 1982, p. 3). One participant shared that she felt that she was stereotyped as a women the entire first half of her career, all the way up to the point when she earned the rank of full professor. Another shared her story of stereotyping by her department chair where he would not call her by the correct name. He would constantly call her by the name of the female secretary’s name in the department or by the name of one of the other two female faculty members in the department. This is an example of Hogg et al.’s (1995) findings that members of
a group may become “depersonalized” as the individual’s self may not be taken into
consideration by others; the person is generalized into the characteristics of the group into which
they fall. The participant mentioned that her department chair doesn’t need to look up or have
trouble with the male faculty members’ names in their department – just the women, and in her
words it is “offensive.”

King et al. (2010) found that the woman who is identified as the token in her work group
may perceive that she is being discriminated against and feels her inputs are not heard or
considered. This study uncovered the experience of when a woman faculty member tries to raise
her hand in a meeting to have a turn to speak, she will either be called upon last after everyone
else, if she is called on at all. This is what Tajfel and his colleagues studies’ describe as
preferentialism for those in the in-group, while discriminating against the out-group (Taylor et
al., 1978).

Men and Women Members of Faculty do Different Type of Service

Women tend to focus more and on different types of service work than their male
colleagues (Vesterlund et al., 2014). Guarino and Borden (2016) found that more of the women
faculty members’ service work is in support of the institution, i.e. “taking care of the academic
family” (p. 19). O’Meara (2016) says that women faculty members tend to do more internal
service work in support of the University’s operation as suggested by social role theory in which
women traditionally take care of the home while the men are at work. Misra et al. (2011) and
Misra et al. (2012) also found that women tend to do more institutional/internal service work but
added that men lean more towards professional service in their area of study. This service work
with the professional organizations is considered more esteemed and therefore more valuable
during the Promotion, Tenure, and Reappointment process. This behavior was exemplified in
this research study in that one participant turned down an opportunity to be re-elected to the executive board even though she was told the position would be good for her career. She did this because she felt she would not be able to do a good job as she is too overburdened with things that needed to happen at the University. This is yet another example of a woman faculty member in a STEM field sacrificing what is good for her own career and promotability to do what she feels is right for the greater good of the students and the institution.

Conclusion

The research question for this study was, “How do female faculty in STEM fields experience the promotion, tenure, and reappointment process with respect to their service work?” This was a qualitative research study using Interpretive Phenomenological Analysis performed at Lehigh University, a higher research activity doctoral university located in the northeastern United States (The Carnegie Classification of Institutions of Higher Education, n.d.). The theoretical framework chosen for this study was Henri Tajfel’s social identity theory which provides a means to study how the members of a group identify themselves as a member of that group, and the impacts of being identified as a part of the in-group or out-group within the whole group. The findings produced valuable information to add to the existing literature to improve the experiences of women faculty in STEM fields going through the promotion, tenure, and reappointment process.

The findings in this study supported the existing literature. The issues of service burden, (Mamiseishvili et al., 2016; Misra et al., 2011; Misra et al., 2012; Neumann & Terosky, 2007); the promotion, tenure, and reappointment process (Austin & Rice, 1998; Dyer, 2004; Eagan & Garvey, 2015; Misra, et al, 2011; Vesterlund et al., 2014); value of service work (Jaeger & Thornton, 2006; Misra et al., 2011); microaggressions (Hogg et al.,1995; King et al., 2010;
Wolman & Frank, 1975), and men and women members of faculty do different types of service work were all found in the literature (Guarino & Borden, 2016; O’Meara, 2016; Vesterlund et al., 2014). This study, though small in the number of participants, does bring additional information to the small body of literature on service work. It is confirmation that women faculty in STEM fields are experiencing challenges in their progression through academic rank due to their service burden and that they are willing to sacrifice their own promotability to the highest ranks to perform service they see as beneficial for the greater good of the institution, their students, and/or their field of study.

**Recommendations for Practice**

Every faculty member deserves to have the same chance at the ability to earn the highest faculty rank, regardless of gender. The literature on this topic as well as the findings of this study provide information for both men and women members of faculty to understand how women faculty in STEM fields experience the Promotion, Tenure, and Reappointment process. This study was done at one higher research activity doctoral university with a small number of participants, however, the findings might be helpful to other research institutions and to women in non-STEM fields of study. This section will describe some recommendations for institutions of higher education to take to support women faculty in STEM fields earn the highest rank of full professor as well as recommendations for the women faculty members in STEM fields. Please note these recommendations are in no particular order.

**Review University Definition of Service Work**

The first recommendation would be to review, update, and document how the institution defines service work. During the implementation of the faculty ePortfolio system a few years ago, six distinct categories of service were defined. When the system was opened to the members
of faculty, there were a lot of questions from users on what type of service work should be entered, does all their service work need to be entered, and under which category should they put this piece of service or that type of service. Now that the system has been in use for a few cycles, it would be a good idea to review the data that is entered in the six distinct service categories and ensure they are still appropriate and in alignment with changing University efforts and goals with respect to diversity and inclusion and also determine if the categories are sufficient for what people are reporting. Clear instructions need to be created on how to members of faculty should report not only the formal service work they are accomplishing, but also a means to track the informal service work that is taking valuable time as well. Examples of this might be advising and mentoring of students who are not officially marked as that faculty member’s advisee.

To go along with this recommendation, once any updates and adjustments are in place, a communication plan on these changes need to be shared with all faculty members. Perhaps more importantly, the guidelines for promotion, tenure, and reappointment committees need to be updated and made consistent university-wide with respect to service work in alignment with University goals.

The researcher can work with the Deputy Provost for Faculty Affairs to determine where this project would fit in the priority of other system requests. They can work together to determine the best strategy to accomplish this project. This may involve combining with or adding as an additional phase to other ongoing diversity and inclusion projects on campus, specifically those in progress with the University’s ADVANCE grant.

If this recommendation would be implemented, it would hopefully help women faculty members in STEM fields earn a bit more credit for the unofficial service work with which they
are burdened that is preventing them from earning the highest faculty rank. They are spending time on things such as unofficial advising and mentoring and they may or may not be getting credit due to the fact that they may not be entering this information at all in the faculty ePortfolio system and/or the promotion, tenure, and reappointment committees are not taking this unofficial work into consideration because the committee guidelines have not been updated to reflect the changed in University goals and values.

**Use Faculty ePortfolio System for Committee Selection**

Lehigh University implemented a faculty ePortfolio system a few years ago. This is a software repository where faculty members enter their work products of research, teaching, and service. The information in the system, and the system itself is then used during faculty reviews including their promotion, tenure, and reappointments. However, the system has not yet been utilized as a means to select faculty members for representation on committees. As we saw from this research study, the women faculty members in STEM fields shared their experiences of service burden, especially with respect to the number of institutional committees on which these women serve. The researcher believes that if there is a way to aid in those who need to form the committees with information on who has already served, they would then try to select someone who has yet to serve as often.

There is the need for faculty members to participate on committees throughout the institution all the time. These committees can be in the department, within a college, across colleges, or at the University-wide level. When a committee is being formed and people need to recruit participants for that committee, they tend to request the time of the same people over and over because they know them, like to work with them, or for a variety of other reasons. However, a broader set of faculty members could be used for selection if a report could be
generated from the Faculty ePortfolio System showing tally of each faculty member with the number of committees on which they have served within a given calendar year by level. This would allow someone to easily see who has done their fair share of the committee work and should not be selected again until some others have done their service.

In order for this report to be effective and the process to work, faculty participation on committees would need to be accurately tracked within the Faculty ePortfolio System. A concerted campus-wide effort would need to take place to ensure that members of faculty are receiving the credit they deserve for the campus committee work as well as ensuring only those who truly served earn the credit. A bit of a culture change with respect to entering data in the Faculty ePortfolio System would need to be adjusted as well. Currently, faculty members tend to enter all of their work for a calendar year at the very end of that year. In order for a process like this to work well, the committee data would need to be kept up to date.

The researcher can work with the Deputy Provost for Faculty Affairs and the Faculty ePortfolio Strategy Committee over the next several months to determine whether or not this is a worthwhile project to pursue and what particulars need to happen. An education and communication plan would need to be put into place to share this concept with campus and to encourage the use of this type of report when needing to make selections for committee participation. It would need to be determined what other information can and should be included on the report to help with the selection process, things such as college and department, gender, rank, or whatever other criteria is typically utilized for committee selection. Finally, the requirements would then need to be shared with the software vendor for the creation of the report.
If this recommendation were to be implemented, it would provide a means for those who need to form committees with faculty representation a way to see a pool from which they could select and include data on past committee participation as to not request the time of the same people over and over. This would hopefully help to alleviate the service burden that the women in this study identified as problematic for them and their progression towards the rank of full professor.

**Consider Leadership**

This research study found that the women faculty members are experiencing varying struggles with respect to leadership. Either they are not getting the opportunity to be in leadership positions, or if they do get the opportunity, only certain types of leadership roles are considered valuable. The faculty ePortfolio system can again be utilized to help identify members of faculty who may be doing all the right things to try to earn leadership positions but the opportunity has not yet come their way.

A solution for this could be for the members of faculty to identify a service or learning activity as ‘leadership learning.’ This way the departments, colleges, and the University overall would have some information by which they can identify potential leaders within populations that are inadvertently overlooked for these roles.

The second part of this is to also take into consideration administrative leadership within the institution and have it have more value to the promotion, tenure, and reappointment process. Women faculty members tend to do more internal service work, which is not as valued during the promotion, tenure, and reappointment process, and therefore the leadership roles for this type of work is still time intensive, yet not highly valued.
It is incongruous for the institution to want to grow more leaders from the professoriate yet not value that type of work during the promotion, tenure, and reappointment process. These two things needs to be more in alignment if women and other underrepresented populations are to rise to the highest level of faculty ranks. The researcher can work with the Deputy Provost for Faculty Affairs and the director of the ADVANCE program on campus to clearly identify the issue, define some goals and come up with an action plan. This topic is bigger than the other suggestions in that it involves influencing the promotion, tenure, and reappointment process which is a faculty driven activity. A more formal and research intensive approach will need to be taken into consideration when strategizing how to implement this recommendation.

**Recommendations for Future Research**

Based on your conclusions and recommendations for practice, other opportunities for future research have been identified. The most obvious would be to do a similar research study at other research institutions of to see if the results would remain consistent. It would also be interesting to be able to see the results from various types of institutions such as public or private or even varying institution size.

One item in particular that was intriguing from this study is the fact that the women who were at the rank of associate professor with tenure were both willing to sacrifice their own promotability for the greater good of the institution and their students. This nuance itself would be an interesting study that could have broader application to institutions of varying Carnegie Classifications. It might even be noteworthy to see this same type of study applied to industries would yield similar results.

This research study has added to the limited existing body of literature on faculty service work and has identified that women faculty members in the STEM fields are struggling to earn
the highest faculty rank of full professor due to their service burden. It is difficult enough for women to progress in male dominated fields but then adding the additional service burden on top makes the challenge even more difficult. Hopefully colleges and universities get to a place where women faculty in STEM fields are no longer significantly outnumbered by their male counterparts and that gender equity could be a reality.
References


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doi:10.1371/journal.pone.0145146


doi:10.1177/0361684317752643


Appendix A: Recruitment Email

Subject Line: Jennifer O’Brien-Knotts requests your participation

Dear Faculty Member name,

My name is Jennifer O’Brien-Knotts and I am a staff member in the Provost’s Office at Lehigh University and a student in the Doctor of Education program at Northeastern University. I am currently conducting a study for my doctoral dissertation and am requesting your time to participate in my study.

My research study focuses on how female faculty in STEM fields experience the promotion, tenure, and reappointment process with respect to their service work. Through this study, I hope to gain insight into how you interpret your experiences of the promotion, tenure, and reappointment process in your own words.

The following criteria will be used to identify potential study participants:
- Female faculty members who are tenured or on the tenure-track at Lehigh University in the P.C Rossin College of Engineering and Applied Science.
- Employed in an academic department with a field of study identified as a STEM field by Lehigh University’s ADVANCE grant.
- The participant will have gone through at least one promotion, tenure, and reappointment process at Lehigh University
- Willing to participate in a minimum of one interview conducted via Zoom video conferencing
- Agree to the use of audio recording of the interviews
- Agree to the publication of the data collected and analyzed from this study

Participation is voluntary and completely confidential. If you choose to participate in this study, I will be interviewing you about your experiences with the promotion, tenure, and reappointment process with respect to service work. The expected time commitment is between 60 and 90 minutes in a single web-based interview. Your participation is completely voluntary and you can exit the study at any time. All information gathered during the interview will be confidential and a pseudonym will be used in place of your name. All interview data will be destroyed once the study is complete.

If you are interested in participating in this study, please complete this participant form, which should only take about 5 minutes to complete. If you do not complete this participant form to volunteer, you will not be contacted again regarding this research.

Thank you for your consideration to participate in this study. If you have any questions, feel free to contact me at Obrien-Knotts@husky.neu.edu.

Sincerely,
Jennifer O’Brien-Knotts
Appendix B: Informed Consent Form

Northeastern University, Graduate School of Education
Name of Investigator(s): Brian Bicknell, Ed.D. - Principal Investigator; Jennifer O’Brien-Knotts, Doctoral Student Researcher
Title of Project: How women faculty members in Science, Technology, Engineering, and Mathematics (STEM) fields experience the promotion and tenure process with respect to their service work

Informed Consent to Participate in a Research Study

We are inviting you to take part in a research study. This form will tell you about the study, but the researcher will explain it to you first. You may ask this person any questions that you have. When you are ready to make a decision, you may tell the researcher if you want to participate or not. You do not have to participate if you do not want to. If you decide to participate, the researcher will ask you to sign this statement and will give you a copy to keep.

Why am I being asked to take part in this research study?

We are asking you to be in this study because you are a female faculty member who is either tenured or on the tenure-track in the P.C. Rossin College of Engineering and Applied Science at Lehigh University who has gone through at least one iteration of the promotion, tenure, and reappointment process.

Why is this research study being done?

The goal of this research study is to understand how female faculty members in science, technology, engineering, and mathematics (STEM) fields experience the promotion, tenure, and reappointment process with respect to their service work. This study may lead to improved policy and practice regarding service work among the professorate in higher education, and specifically in the promotion, tenure, and reappointment process allowing more female faculty members to achieve the highest rank. More STEM female faculty members benefits not only the women themselves, but their institutions and their students.

What will I be asked to do?

If you decide to take part in this study, we will ask you to participate by allowing the student researcher to interview you.

Where will this take place and how much of my time will it take?

The 60 – 90 minute interview will be conducted via Zoom video conferencing at a day and time of your convenience. You will be provided a link to access the video conferencing once the interview has been scheduled.
Will there be any risk or discomfort to me?

There are no anticipated risks to participants.

Will I benefit by being in this research?

There are no direct benefits offered to participants of this study. However, the findings of this research may inform higher education leadership of how women have overcome any obstacles with respect to their gender in a male dominated organization and subject area. Hopefully this will allow us to identify ways in which we can help more women in STEM fields choose academia and successfully earn the rank of full professor.

Who will see the information about me?

Individual data will only be accessibly by the student researcher, the principal investigator, and the professional transcription service. Files with participant’s information will be de-identified and pseudonyms will be used in place of participant’s names. A Transcript Confidentiality Statement will be signed by the professional transcription company to ensure the confidentiality of participants. Data will be used for this doctoral dissertation and future journal articles or presentations. Data will be kept confidential for all participants.

A copy of each interview recording will be saved to an online storage account. To ensure confidentiality and security, all files will be encrypted and password protected using a professional online storage service. Transcripts will be saved and de-identified in the same manner as recordings and will be accessible by the student researcher and principal investigator only. Hard copies of consent forms will be stored in a locked file cabinet in a locked office only accessible by the student researcher. Upon completion of the study, all data will be transferred to an external hard drive and stored in a locked file cabinet owned by the student researcher for three years.

All data and associated documents, including all signed consent forms will be permanently destroyed or deleted three years after completion of the study.

In rare instances, authorized people may request to see research information about you and other people in this study. This is done only to be sure that the research is done properly. We would only permit people who are authorized by organizations such as the Northeastern University Institutional Review Board or the Lehigh University Institutional Review Board to see this information.

If I do not want to take part in the study, what choices do I have?

Participation in this study is voluntary and you are free to withdraw from the study at any time.
What will happen if I suffer any harm from this research?

No special arrangements will be made for compensation or for payment for treatment solely because of my participation in this research.

Can I stop my participation in this study?

Your participation in this research is completely voluntary. You do not have to participate if you do not want to and you can refuse to answer any question. Even if you begin the study, you may quit at any time. If you do not participate or if you decide to quit, you will not lose any rights, benefits, or services that you would otherwise have as a member of faculty.

Who can I contact if I have questions or problems?

If you have any questions about this study, please feel free to contact Jennifer O’Brien-Knotts at O'BrienKnotts.j@husky.neu.edu, the person mainly responsible for the research. You can also contact Brian Bicknell, Ed.D. at b.bicknell@northeastern.edu, the Principal Investigator.

Who can I contact about my rights as a participant?

If you have any questions about your rights in this research, you may contact Nan C. Regina, Director, Human Subject Research Protection, Mail Stop: 560-177, 360 Huntington Avenue, Northeastern University, Boston, MA 02115. Tel: 617.373.4588, Email: n.regina@neu.edu. You may call anonymously if you wish.

Will I be paid for my participation?

There will be no remuneration offered to participants.

Will it cost me anything to participate?

There will be no cost to participate in this study, other than your time.

I agree to take part in this research.

Participant Signature ________________________________ Date ________________________________

Printed Name of Participant ____________________________________________

Researcher Signature ________________________________ Date ________________________________

Jennifer O’Brien-Knotts
Printed Name Researcher
Appendix C: Interview Protocol

**Objective:** This section of the interview will describe the study, review some interview basics, such as recording, confidentiality, IRB requirements, etc.

**Interviewer:** You have been selected to speak with us today because you have been identified as someone who has a great deal to share about your experiences along your professional journey as a female faculty member in a STEM field. My research project focuses on the experiences of women during the promotion, tenure, and reappointment process with respect to their service work. Through this study, we hope to gain more insight into how women have overcome any obstacles with respect to their gender in a male dominated organization and subject area. Hopefully this will allow us to identify ways in which we can help more women in STEM fields choose academia and successfully earn the rank of full professor.

**Interviewer:** Because your responses are important and I want to make sure to capture everything you say, I would like to record the audio of our conversation today. Do I have your permission to record this interview?

- **If yes, thank the participant, and start the recording**
- **If no, explain this is a requirement of participating, thank the participant and end the interview.**

**Interviewer:** I will also be taking written notes. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts.

**Interviewer:** To meet our human subjects requirements at both Northeastern University and Lehigh University, you have already signed the Informed Consent form. Essentially, this document states that:

1. all information will be held confidential
2. your participation is voluntary and you may stop at any time if you feel uncomfortable
3. we do not intend to inflict any harm

**Interviewer:** To review a few more items

- The only people who will be privy to the recordings are myself, my dissertation advisor and principal investigator Dr. Brian Bicknell, and the transcription service.
- Physical and electronic documents will be kept secure and will be destroyed 3 years after completion of the study.

**Interviewer:** Do you have any questions about the interview process or how your data will be used?

**Interviewer:** This interview should last about 45 minutes. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt
you in order to push ahead and complete this line of questioning. Do you have any questions at this time?

Interviewee Background

**Objective:** To establish rapport and obtain the story of the participants’ background in general

1. Please share your current faculty rank, home department, and college.

**Interviewer:** I can see from your questionnaire your progression through the academic ranks at Lehigh. I can see you were an assistant for X years and an Associate Professor for Y years. [Review data submitted from questionnaire].

**Interviewer:** One of the things I am interested in learning about is what you think you did in order to be successful as a woman in STEM. I would like to hear about your perspective/experience about your journey in your own words. To do this, I am going to ask you some questions about the key experiences you encountered. If you mention other people, please use do not mention names. As a reminder, I will be using a pseudonym for you as well.

2. **What is your area of expertise?**
3. **When did you first know that you were interested in a STEM field?** Possible prompts: How old were you? What grade?

**Interviewer:** Let’s shift back now to your professional life.

4. **Please share the gender breakdown of the tenured/tenure track faculty of your department.** Possible Prompts: How many men vs. women? (In group/Out group)
5. **Do you identify closely with other members of your department/college/University?** (Social identity and the organization) Possible Prompts: It what ways? How? Describe the characteristics of those with whom you identify – rank, subject area, gender, etc?
6. **Are there any “groupings” that occur among the tenure track faculty in your department/college? Share your experiences/feelings regarding these groups.** (In group/Out group) Possible Prompts: Perhaps by research topics or gender? For example, at department meetings how do people naturally seat themselves/speak with before the formal meeting starts?
7. **Please share any experiences with me of when you felt that you were stereotyped within your department or college based solely upon your gender?** (In group/Out group)

**Interviewer:** This next set of questions is focused specifically on the when you were going through the promotion and tenure process here at Lehigh,

8. **Do you remember the number of men vs women who were tenured or on the tenure track?** (In group/Out group) Possible Prompts: Was it around the same as today? Or more or less women compared to men?
9. **Please describe any expectations set by your department for promotion and tenure specific to service work.** Possible Prompts: For example, can you describe any definitions, guidelines, or recommendations provided?
10. **Please share your thoughts on whether or not you think service work is valued during the promotion and tenure process.** Possible Prompts: By your
department/college/Lehigh? Do you think some service work is more valued than others? Explain? Examples?

_Time on Service Work_

_Interviewer:_ The default amount of time faculty should spend on Research is 40%, Teaching is 40% and Service is 20%.

11. **Do you think 20% is accurate for the time you actually spend on service work?**
   *Possible prompts:* If not, what would be a more accurate percentage for you at each rank? If more than 20%, what other area gets less time? Research or Teaching?

12. **Do you feel you had to adjust your natural tendencies on how you spend your time specifically on service work in order to progress through rank?** (*Social identity and the organization*) _Possible prompts:_ Why so? How? Did you want to do more or less service work?

13. **Share with me some examples of when you have been asked by your department/college/University to participate on committees or other types of service?** _Possible prompts:_ Do you know why or was it ever shared with you why you were asked to be on a particular committee? Do you feel that you were specifically asked due to the fact that you’re female? What are your thoughts on this? Do you feel you could say no to these requests for your time? Why or why not? Is this a regular occurrence? Do you feel you were asked to do service work that took time away from your research?

_Types of Service Work_

14. **Please share with me the types of service work you have performed throughout your career.** _Possible Prompts:_ as an Assistant Professor, an Associate Professor, as a Full Professor.

15. **Share your thoughts on the types of service work your male counterparts did at the same rank.** _Possible Prompts:_ as an Assistant Professor, an Associate Professor, as a Full Professor. Do they do the same type of service work that you do? If no, what type do they do?

16. **How would you generalize, describe, or categorize the types of service work you perform?** _Possible Prompts:_ What about the types your male counterparts perform? Are they the same/different?

_Impacts on Promotion & Tenure_

17. **Talk with me about whether or not you think your service work has impacted your ability to earn promotions and/or tenure, if at all?** _Possible prompts:_ The type of service work? The amount of time you put into your service work?

18. **Do you feel the promotion and tenure process was easier/harder/no difference for you being a woman in a predominantly male subject area?** (*In group/Out group*) _Possible prompts:_ How so?

19. **What do you feel that you did specifically with regards to service work that made you successful in earning your promotions, if anything?** _Possible prompts:_ Limiting service work? Types of service work?
20. Do you have any final thoughts or is there anything else you would like to share regarding the promotion and tenure process with respect to service work?

Interviewer: This concludes today’s interview. Thank you so much for your participation in my study.