

FINAL REPORT

**Gaps in Professorial Compensation for
Women, Visible Minorities, and Indigenous
Peoples at the University of Alberta**

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THE ASSOCIATION OF ACADEMIC STAFF UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA

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BACKGROUND AND MANDATE

Gaps in Professorial Compensation for Women, Visible Minorities, and Indigenous Peoples at the University of Alberta

Dr. Malinda S. Smith (Task Force Co-Chair)

Dr. Paige Lacy, Dr. Zubia Mumtaz (Co-Chairs),

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Ms. Kathryn E. Chaffee (Research Assistant)

THE ASSOCIATION OF ACADEMIC STAFF UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA

GAPS IN PROFESSORIAL COMPENSATION FOR WOMEN, VISIBLE MINORITIES, AND INDIGENOUS PEOPLES AT THE UNIVERSITY OF ALBERTA

2017 TASK FORCE ON SALARY EQUITY

THE ASSOCIATION OF ACADEMIC STAFF UNIVERSITY OF ALBERTA

PART I: MANDATE AND BACKGROUND

ABOUT THE AASUA

Established during the 1930's, the Association of Academic Staff of the University of Alberta (AASUA) is the exclusive bargaining agent for the over 4,000 members of the academic staff.

The AASUA's mission is to organize and support collective bargaining as a means to protect, strengthen, and advance the collective interests of its members.

The Association also works to promote the core principles of the academy, foremost amongst them academic freedom, to ensure higher education's contribution to the common good.

As a member-driven democratic organization, the Association aspires in all of its work, activities, and decision-making to maximizing the full participation and engagement of all of its members while promoting equity, diversity, dignity, and economic security for all.

The AASUA is also committed to overcoming, both at the University and in Canadian culture more broadly, historical and structural inequities relating to gender identity, sexuality, ability, age, racial, ethnic or religious identity, and family status.

Our commitment to diversity with equity is rooted in our respectful acknowledgment that we live and work on Treaty 6 territory, a traditional gathering place for diverse Indigenous peoples including the Cree, Blackfoot, Métis, Nakota Sioux, Iroquois, Dene, Ojibway/ Saulteaux/Anishinaabe, Inuit, and many others whose histories, languages, and cultures continue to influence our community.

DISCLAIMER: The open-accessed information drawn upon in this report was correct, to the best of the Task Force's knowledge. Most of the internet resources drawn upon were free and publicly available; however, this could change and future access could be behind a paywall and require a fee. It is not uncommon for the location of internet resources to change with the reorganization of websites. Often the resources are archived or can be located with a search by author or title as included in this report. The publically available University of Alberta 2015 Compensation data was used in this report. The use of this data does not constitute an endorsement of the accuracy of this information as publically reported.

2017 SALARY EQUITY TASK FORCE MEMBERS

***Paige Lacy** is a Professor in the Department of Medicine, and Director of the Pulmonary Research Group at the University of Alberta

***Zubia Mumtaz** is an Associate Professor in the School of Public Health at the University of Alberta

***Malinda S. Smith** is a Professor in the Department of Political Science at the University of Alberta

Andrew McGee is an Associate Professor in the Department of Economics, Faculty of Arts, at the University of Alberta

Rhonda J. Rosychuk is a Professor in the Division of Infectious Diseases, Department of Pediatrics, and the Director of the Biostatistics Consulting Group at the University of Alberta

Natalie Sharpe is the Director of the Office of the Student Ombuds at the University of Alberta

Cora Weber-Pillwax is an Associate Professor in the Department of Educational Policy Studies, and the Indigenous People Education Specialization Coordinator at the University of Alberta

Janice Williamson is a professor in the Department of English & Film Studies, Faculty of Arts, at the University of Alberta

Carolyn Sale (ex officio) is an Associate Professor in the Department of English & Film Studies, and the 2016-2017 President of the Association of Academic Staff University of Alberta

Brygeda Renke (ex officio) is the Executive Director and Chief Legal Counsel for the Association of Academic Staff University of Alberta.

Kathryn Everhart Chaffee (Research Assistant) is a doctoral student in the Department of Psychology, Faculty of Arts, at the University of Alberta

Yang S. Liu (Research Assistant) is a Postdoctoral Fellow in the Department of Educational Psychology, Faculty of Education, at the University of Alberta

* denotes Task Force Co-Chair

ACKNOWLEDGEMENTS

Over the course of its extended deliberations and work the AASUA Salary Equity Task Force received significant assistance from a number of individuals and organizations. We owe special thanks to our outstanding research assistants, Dr. Yang S. Liu and Kathryn Chaffee. Without them the completion of this work would not have been possible in the six-months time-frame. We are also indebted for the generous support of the staff in the AASUA office for assistance with advertising and hiring the research assistants, and for logistical support: Thank you to Brygeda Renke, Leanne Rosinski, Roxanne Rowe, Linda Wagner and Shelagh Prowse. Finally, we extend our appreciation to the AASUA's President who spearheaded the 2016-2017 Council's approval of a Salary Equity Task Force, and to the Council for the support provided, and especially for the important questions and feedback during the presentation at Council. Our conversations individually and collectively enhanced our deliberations and the final report.

MANDATE AND BACKGROUND

The purpose of a salary equity review is to provide redress for a faculty member or cohort of faculty members whose salaries are determined to be unfair or anomalous by internal university standards. A salary anomaly occurs when an individual or cohort's salary is at significant variance with normal salary ranges among faculty peers. To assess whether salary inequities exist for some or all women, visible minorities, and Indigenous peoples at the University of Alberta, the Salary Equity Task Force ran multiple regression analyses to determine whether the salaries of these designated group members were anomalous in comparison with similar non-designated group members based on criteria (variables) such as years since highest degree, length of service, rank, years in rank, awards (e.g. Canada Research Chairs, other endowed chairs), and faculty or school. Salary equity reviews are informed by law and the basic principle of “equal pay for equal work.” Regularized salary equity reviews are essential to redress salary inequities and to prevent or, at least limit, their reappearance over time.

Unlike other universities in the province, the University of Alberta has not yet conducted an open and transparent salary equity review. Athabasca University's salary review was in the early-2000s, and the University of Calgary's in 2005, and the University of Lethbridge in 2009. Unlike most comparators in the U15 research-intensive universities, the University of Alberta has not publicly expressed a commitment to pay equity or to a regularized salary equity review process. In contrast, comparator institutions such as the University of British Columbia (2010), McGill (2010, 2016), Queen's (2008, 2016), Waterloo (2008, 2016), and Western (2005) have conducted salary equity reviews in the years indicated and reached settlements. These salary equity initiatives were primarily focused on the gender wage-gap. The AASUA Salary Equity Task Force's mandate, uniquely, is inclusive of all four federally-designated groups — women, visible minorities, Indigenous peoples, and persons with disabilities.

On 15 December 2016, the 2016-17 President of the Association, Carolyn Sale, asked the Association of Academic Staff University of Alberta (AASUA) Council to establish a Task Force on Salary Equity with the following mandate:

THAT AASUA Council strike a Task Force on Salary Equity that will investigate, what, if any, inequities in salary exist for members of the academic staff who are women, members of visible minority groups, Indigenous, or persons with disabilities, and report to Council at its meeting in May 2017 with its recommendations for how these inequities should be addressed.

While the Task Force began its work with an examination of salary inequities in the professoriate, the Association is committed to assessing and addressing salary inequities for all of its constituencies.

A call for members to serve on the Salary Equity Task Force was issued by the Association on January 4, 2017 and, one month later, on February 7, President Carolyn Sale approved the appointment of six academic staff members from across Faculties and designated groups to serve alongside former AASUA Equity Chair Dr. Malinda S. Smith (Professor, Political Science) and Current AASUA Chair Dr. Janice Williamson (Professor, English & Film Studies). These members included:

- Dr. Paige Lacy, Professor and Director of the Pulmonary Research Group, Medicine & Dentistry
- Dr. Andrew McGee, Associate Professor, Economics
- Dr. Zubia Mumtaz, Associate Professor, Public Health
- Ms. Natalie Sharpe, Director of the Office of the Student Ombuds
- Dr. Rhonda Rosychuk, Professor of Pediatrics, and Director of Biostatistical Consulting Group
- Dr. Cora Weber-Pillwax, Associate Professor, Education, and the Indigenous People Education Specialization Coordinator

President Sale and the Association's Executive Director and General Legal Counsel, Brygeda Renke, served on the Task Force as *ex officio* members. At its first meeting the Task Force selected Drs. Lacy, Mumtaz, and Smith to serve as co-chairs, and Dr. Rosychuk would serve as its lead on data collection and analyses. Finally, two research assistants, Kathryn Chaffee and Yang Liu, were hired by the AASUA to support the Task Force's work.

The Salary Equity Task Force at the University of Alberta was long overdue. Twenty-three years ago, the University of Alberta sought to institutionalize a commitment to employment equity as required by the *Employment Equity Act* and the Federal Contractors Program (FCP). The Board of Governors approved "Opening Doors: A Plan for Employment Equity at the University of Alberta" in January 1994. Since then, there has been no university-wide renewal of that plan or any task force to create a new plan. While it is notable that the 2016 Institutional Plan, "For the Public Good," commits the University to equity, diversity, and inclusion initiatives, it is not connected to an institutionally approved employment equity plan and, thus, "Opening Doors" remains the on-the-books policy.

In "Opening Doors" the University committed itself to pay equity review for members of the four designated groups — women, Indigenous peoples, visible minority groups, and persons with disabilities. Section 4.4.1.1. of "Opening Doors" called for a salary anomaly committee as the salary data at that time:

...reveal[ed] that average salaries for the designated groups are generally lower than the average salaries paid to males. The most striking differences appear between the average salary paid to males and average salary paid to females and aboriginal peoples (26).

The goal of the proposed salary anomaly was identified as follows:

5.11.4 Salary Anomalies — A correction of a salary anomaly is an increase in the salary of a Faculty member awarded because it has been determined that his or her salary is low relative to the salaries of colleagues with similar qualifications, experience and abilities.

Twenty-three years since it stated this goal, the University of Alberta has yet to establish the promised salary anomaly committee and it has yet to identify and remedy what salary inequities, if any, continue to exist for women, Indigenous peoples, visible minorities, and persons with disabilities.

For almost a decade now the AASUA has been calling upon the University to fulfill its commitment to

equity in general, and salary equity in particular. In May 2013, Dr. Malinda Smith (Political Science), then chair of the Association's Equity Committee, presented to AASUA Council and the University community a 14-page report, "Opening Doors, Closing Gender Gaps: Female and Male Professors by Rank, Diversity and Faculty at the University of Alberta." In its conclusion this report renewed the call for a task force on pay equity that would "undertake a comprehensive salary review that examines both the gender wage gap and the pay gaps among equity groups." As well, in an invited presentation to the joint University-AASUA Renaissance Committee on June 11, 2013, Dr. Smith and members of the AASUA's Equity Committee renewed the call for the University to close the diversity gaps and to establish a University salary equity review committee. In the Renaissance Committee's Final Report (22 November 2013), recommendation 5-10 echoed the Equity Committee's call for "a joint AASUA/Admin task force to address equity issues that have already been identified by previous working groups/committees, and provide policy that commits academic staff to equity and diversity in all respects" (15).

In anticipation of the salary disclosures to occur at the University of Alberta by 30 June 2016 under the Government's Public Sector Compensation Disclosure Act, the Provost Office convened an informal "pay equity working group" to examine the gender wage gap and develop recommendations. The Association's current Equity Committee chair, Dr. Janice Williamson (English & Film Studies), was permitted to sit in on the meetings of this working group — but simply as an observer not as an official AASUA-designated representative. In that capacity, she strongly advocated for an approach to salary equity inclusive of all four equity-seeking groups (women, visible minorities, Indigenous peoples, and persons with disabilities.) The report of that pay equity working group has never been made public. Nor has the University expressed a commitment to or undertaken a salary equity review inclusive of visible minorities, Indigenous peoples, and persons with disabilities.

The premise of AASUA Council's mandate was that it was time for the Association to take the lead by establishing the 2017 AASUA Salary Equity Task Force. The Task Force commenced its work in February 2017. Over the course of the Winter and Spring 2017 terms, the Task Force met a number of times in small working groups as well as in full to discuss various aspects of its work. Its reports to AASUA Council included a preliminary presentation of the Task Force's findings to AASUA Council on 25 May 2017 by Dr. Rosychuk, and a presentation on the case study of gender wage-gap in the Faculty of Medicine and Dentistry by Dr. Paige Lacy. Questions from Council were addressed by the presenters as well as the Task Force's co-chairs. On 29 June 2017 the Task Force offered a full report to AASUA Council along with recommendations.

While this report represents the culmination of the Task Force's salary equity review drawing on an analysis of 2015 compensation data and a review of the literature and institutional practices to remedy salary inequities, the Task Force's recommendations also include a rationale for further study drawing on non-publicly disclosed data available through Human Resources.

The remainder of the report includes the following sections:

- An Executive Summary and Recommendations;
- A Review of the Literature and Institutional Salary Equity Practices; and
- The full salary equity review and analysis of the University of Alberta's 2015 Compensation Disclosure

EXECUTIVE SUMMARY

Gaps in Professorial Compensation for Women, Visible Minorities, and Indigenous Peoples at the University of Alberta

Findings from the **Salary Equity Task Force 2017**

Paige Lacy, Malinda S. Smith, Zubia Mumtaz, Rhonda J. Rosychuk, Andrew
McGee, Cora Weber-Pillwax, Janice Williamson, Natalie Sharpe, Carolyn Sale,
Yang Liu, Kathryn Everhart Chaffee

THE ASSOCIATION OF ACADEMIC STAFF UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA

GAPS IN PROFESSORIAL COMPENSATION FOR WOMEN, VISIBLE MINORITIES, AND INDIGENOUS PEOPLES AT THE UNIVERSITY OF ALBERTA

A. OVERALL SUMMARY OF DATA

In 2016, the Association of Academic Staff University of Alberta (AASUA) struck a Task Force on Salary Equity based on the public disclosure of professorial compensation. The Task Force was given the authority to investigate, on behalf of the Association, salary inequities, if any, that currently exist for members of the academic staff who are women, members of visible minority groups, Indigenous peoples (First Nations, Métis, and Inuit), or persons with disabilities with the goal of developing for the Association recommendations on how these inequities should be addressed. The objective of the Task Force was to identify and quantify any differences in compensation in 2015 in these groups. We used two publicly available data sources: the 2015 Compensation Disclosure List and the list showing Continuing Academic Staff for 2014-2015. This report does four things: first, it provides a Backgrounder on the Task Force; second, in this section we provide an Executive Summary of the Task Force's work and describe the findings that derive from an analysis of the Compensation List; the third section presents a review of the literature on salary (in)equities; and the fourth, and final section provides the full data analysis and findings.

Our analysis examined compensation for non-MD professoriate that included those in academic leadership roles (associate/chairs, assistant/associate deans, vice-deans, and associate/deans). A separate analysis was carried out for those without leadership roles, since individuals with leadership roles may be compensated differently from the remainder of the professoriate. In addition, MDs were not included in the analysis as they are compensated in a different manner from PhD-trained professors.

The professoriate with leadership dataset identified 1,008 professors at the assistant, associate and full professors ranks, who received more than \$125,000 in compensation in 2015. This dataset represents only the top 35% of income-earners in the population of full-time continuing academic staff across 18 faculties, schools and campuses at the University of Alberta (total 2,880). While this dataset using the compensation disclosure list provides some evidence of salary inequities, we also recognize that we are dealing with data that are incomplete: first, professors had to be greater than \$125,000 to be on the compensation disclosure list; second, some individuals who made the threshold were excluded; third, the list does not account for partial hires, sabbaticals, maternity, health or other kinds of leaves. Ultimately, we believe only an examination of the non-public data can determine the actual inequities. For example, if there are more women than men excluded from the disclosure list because they make less than \$125,000, then including all of these people in an all person analysis would likely show that there is a gender difference in all models. Therefore, discrepancies in salary gaps are not evident in all of the comparisons made in this analysis. The analysis contained the following parameters:

- Overall there were 300 women and 708 men
- 807 professors identified as white, of which 252 (31.2%) are women
- 193 professors identified as visible minorities, of which 43 (23.3%) are women
- Eight professors identified as Indigenous, of which 5 (62.5%) are women
- Most individuals had a PhD (87.2%)
- The majority were full professors (74.3%)
- No publicly available records exist for professors with disabilities, although there is at least one in the dataset that falls in this category

Summary	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	43	150	5	3	252	555
Minimum	\$126,266	\$125,723	\$127,619	\$126,306	\$125,255	\$125,244
25th percentile	\$134,572	\$140,535	\$128,200	\$126,557	\$137,139	\$146,480
Average	\$164,519	\$173,900	\$135,374	\$174,401	\$163,693	\$184,030
Median	\$146,352	\$160,785	\$133,031	\$126,808	\$152,590	\$166,959
75th percentile	\$163,149	\$187,108	\$141,843	\$198,449	\$176,089	\$203,381
Maximum	\$546,237	\$430,853	\$146,177	\$270,089	\$360,503	\$542,706
Standard Deviation	\$70,333	\$50,991	\$8,301	\$82,868	\$37,935	\$57,094

Table 1. Compensation data for genders, visible minorities, and Indigenous peoples at the University of Alberta based on the 2015 Compensation Disclosure Data.

There were fewer women ($p < 0.001$), as well as visible minorities and Indigenous peoples ($p = 0.003$), at the full professor rank than at the assistant professor or associate professor ranks. There were 19 deans (1.9%) and 61 chairs (6.1%). Relatively few visible minorities and Indigenous peoples held leadership roles.

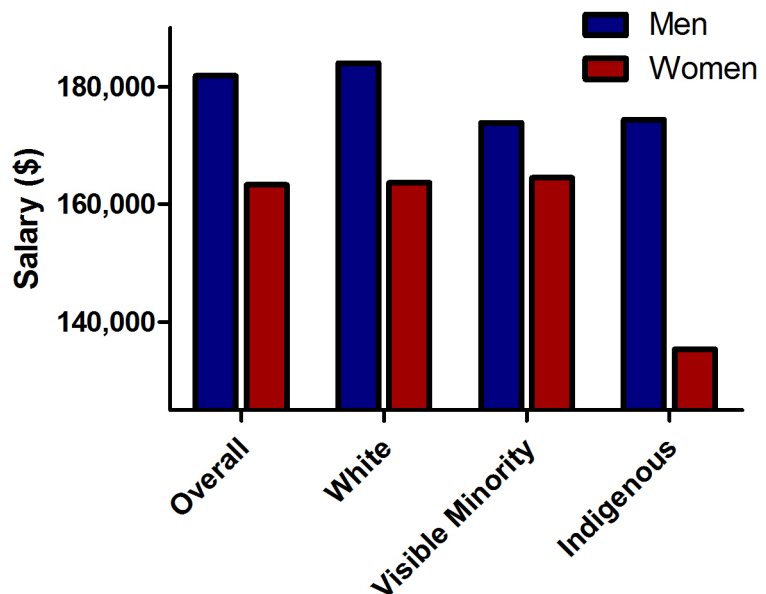
Overall, median compensation was \$160,558 (average = \$176,336) for all individuals in the dataset. This should not be considered representative of the entire cohort of Continuing Academic Staff at the University of Alberta, as only salaries of greater than \$125,000 were considered in this analysis.

B. GENDER

In total, there were fewer women than men in the professoriate (29.8%, 300/1,008). There were also fewer women than men at the full professor rank for both white (69.4% vs 79.8%, $p = 0.005$) and visible minority (48.8% vs 71.3%, $p = 0.010$) groups.

When compensation was considered for all individuals in this dataset, *median* compensation was lower for women than for men (\$150,079 for women vs \$164,861 for men, difference = -\$14,782, $p < 0.001$). *Average* compensation for women was \$163,340 vs \$181,843 for men (difference = -\$18,504, $p < 0.001$ for men). Table 1 shows the values for each of the groups that were analyzed in this report.

Median compensation for white women was also lower than for white men (\$152,590 vs \$166,959, difference = -\$14,369).



Graph 1. Comparison of average salary support for men and women in white, visible minorities, and Indigenous people categories.

Average compensation for white women was \$163,693 vs \$184,030 for white men.

Graph 1 shows the average compensation for the professoriate by the three inequity variables: gender, visible minority and indigenous status. Averages are used in this graphical representation as the numbers in the Indigenous group were too small to arrive at meaningful values using median values.

The numbers of women in each category were as follows:

- White women, 31.2% (252/807 white women in total white group)
- Visible minority women, 22.3% (43/193 visible minority in total visible minority group)
- Indigenous women, 62.5% (5/8 Indigenous women in the total Indigenous group)

C. VISIBLE MINORITIES

There were fewer visible minority women than men in the professoriate (22.3%, 43/193), and the proportion of visible minority women in this group was smaller than that of white women in the white groups. The median compensation for visible minority women was lower than for visible minority men (\$146,352 vs \$160,785, difference = -\$14,433). Average compensation for visible minority women was also lower than visible minority men (\$164,519 vs \$173,900, difference = -\$9,381).

D. INDIGENOUS PEOPLES

There were more Indigenous women than men in the professoriate (62.5%, 5/8). While the *median* compensation for Indigenous women was higher than for Indigenous men (\$133,301 vs \$126,808, difference = +\$6,493), the *average* compensation was lower for Indigenous women than for Indigenous men (\$135,374 vs \$174,401, difference = -\$39,027). For this reason, it is more useful to compare averages across the different groups (Graph 1). However, the sample size of this group (8) was too small to show significance in any comparisons.

E. RECOMMENDATIONS

The Task Force determined that salary inequities currently exist for members of the academic staff who are women, members of visible minority groups, Indigenous peoples (First Nations, Métis, and Inuit), based on the 2015 Compensation Disclosure data. The limitations of the analysis are detailed in the full report. It is important to note that this statistical analysis is weakened by having only a proportion (35%) of the professoriate evaluated based on the sunshine list. We conclude that there is sufficient evidence to warrant an investigation of compensation at the University of Alberta using Human Resources data that are complete and accurate. The following section describes our recommendations.

We recommend that:

- A more detailed analysis of all salaries for all professors be carried out using Human Resources data to include those individuals missing from the 2015 Compensation Disclosure Data, specifically those professors (65%) that earn less than \$125,000 per year.
- The Association obtain the numbers of professors with disabilities at the University of Alberta.
- Additional analyses be carried out to examine differences in compensation by gender, visible minorities, Indigenous peoples, and if possible, persons with disabilities, and provide evidence for the amounts required for equity based on the variables used in our analysis.
- Ongoing, regularized analysis of salary anomalies for women, visible minorities, Indigenous peoples, and persons with disabilities who are assistant, associate, and full professors at the University of Alberta, and not limited to the salaries revealed in the annual Compensation Disclosure Data.

- Prevent salary pay inequities in starting salaries and discretionary salary. While policies that support equitable hiring and starting salary negotiation may have an impact on the results of future University of Alberta salary equity analyses, policies promoting the equitable distribution of discretionary pay ensure that equity in starting salaries is not lost over the course of a career.
- Address intersectional salary equity matters through collective bargaining and binding agreements. The following indicates some of the matters negotiated in faculty collective agreements at other Canadian universities:
 - Agree that the employer will share with the AASUA relevant information and data to analyse and monitor salary equity on an ongoing basis.
 - Incorporate provisions for assessment that shall apply such that: “different and diverse experiences, . . . contributions to knowledge . . . [and different] vision, values, cultural mores, methodologies and epistemologies in critical analysis,” do not use the permissive “may.” (See CAUT Bargaining Advisory “Bargaining Inclusivity for Indigenous Academic Staff 32 (2010): 9.)
 - Develop effective strategies to achieve results and change the faculty complement to reflect the evolving composition of Canadian society, including appropriate representation of the designated groups.
 - Ensure that childcare provisions address equity barriers.

If additional analyses conducted on the full cohort of the professoriate support the current findings, we recommend the adoption of three different compensation models, which can be used alone or in combination to address gender, visible minority, and Indigenous peoples pay gaps:

- **Group Award:** A flat, retroactive salary award is to be given to all women, members of visible minorities, and Indigenous peoples. The amount should be determined through regression analysis, with below-the-line correction.
- **Below-the-Line Correction:** Salary corrections are to be awarded only to those individuals whose salaries are below their predicted salaries, as determined by regression models.
- **Individual Case Review:** Individual faculty members apply to have their salaries reviewed. Emphasis will be made to review those salaries that are lower than predicted by regression models.



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LITERATURE REVIEW

Gaps in Professorial Compensation for Women, Visible Minorities, and Indigenous Peoples at the University of Alberta

Findings from the **Salary Equity Task Force 2017**

Malinda S. Smith, Kathryn Everhart Chaffee, Janice Williamson,
Paige Lacy, and Zubia Mumtaz

THE ASSOCIATION OF ACADEMIC STAFF UNIVERSITY OF ALBERTA
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LITERATURE REVIEW

A. INTRODUCTION

This literature review, conducted for the Association of Academic Staff of the University of Alberta, investigates the factors that shape salary, and particularly salary inequities, in the academy. It examines what salary inequities, if any, have been identified in universities as well as the implications of these factors for employment equity designated groups, including women, visible minorities and Indigenous peoples (First Nations, Métis, and Inuit). Additionally, we reviewed a significant number of publicly available salary equity initiatives at universities in Alberta, across Canada and the United States, to explore the practices universities adopted to close the salary gaps wherever they were found.

Our review examined overall issues related to inequities and anomalies as well as specific issues as relates to the Canadian Employment Equity Act's "designated groups," which include women, visible minorities, Aboriginal/Indigenous peoples, and persons with disabilities. A paucity of literature on persons with disabilities led to a focus primarily on salary equity as relates to three of the designated groups. Consistent with the spirit of the Act, our overall analysis took an intersectional approach (Crenshaw, 1989, 1992, 2012; Bilge and Hill Collins 2016), meaning we wanted to examine the relationship between the groups of professors. For example, how do the salaries of visible minority women and men compare with the majority of white women and men professors? Or, what are the similarities and differences among women professors: Do the same factors shape the salaries of white, visible minorities and Indigenous women, for example? Put differently, what do we learn if we examine how gender intersects with race/ethnicity and indigeneity? This Salary Equity Task Force is among the first in Canada to undertake a more inclusive and intersectional approach to salary equity.

What follows is a summary of our findings from the literature review and salary equity initiatives at Canadian universities. We examine the issues emerging from the literature in the following four sections that focus on:

- salary equity and women, visible minorities, Aboriginal/Indigenous Peoples, and persons with disabilities;
- factors that shape salary (in)equities, including debates on merit and the relationship between equity and excellence;
- publications and citations, teaching, mentoring and training, and service and administration.

B. SALARY (IN)EQUITIES AND EQUITY GROUPS

WOMEN

We examined 54 articles that addressed salary equity as relates to women in academia. A large majority (46 or 85%) of these articles found women were underpaid compared to men and the difference was statistically significant.

- Only three studies found no difference after controlling for variously defined 'merit indicators':
 - o Berkeley's 2015 study found gender disparities in most models, but no salary

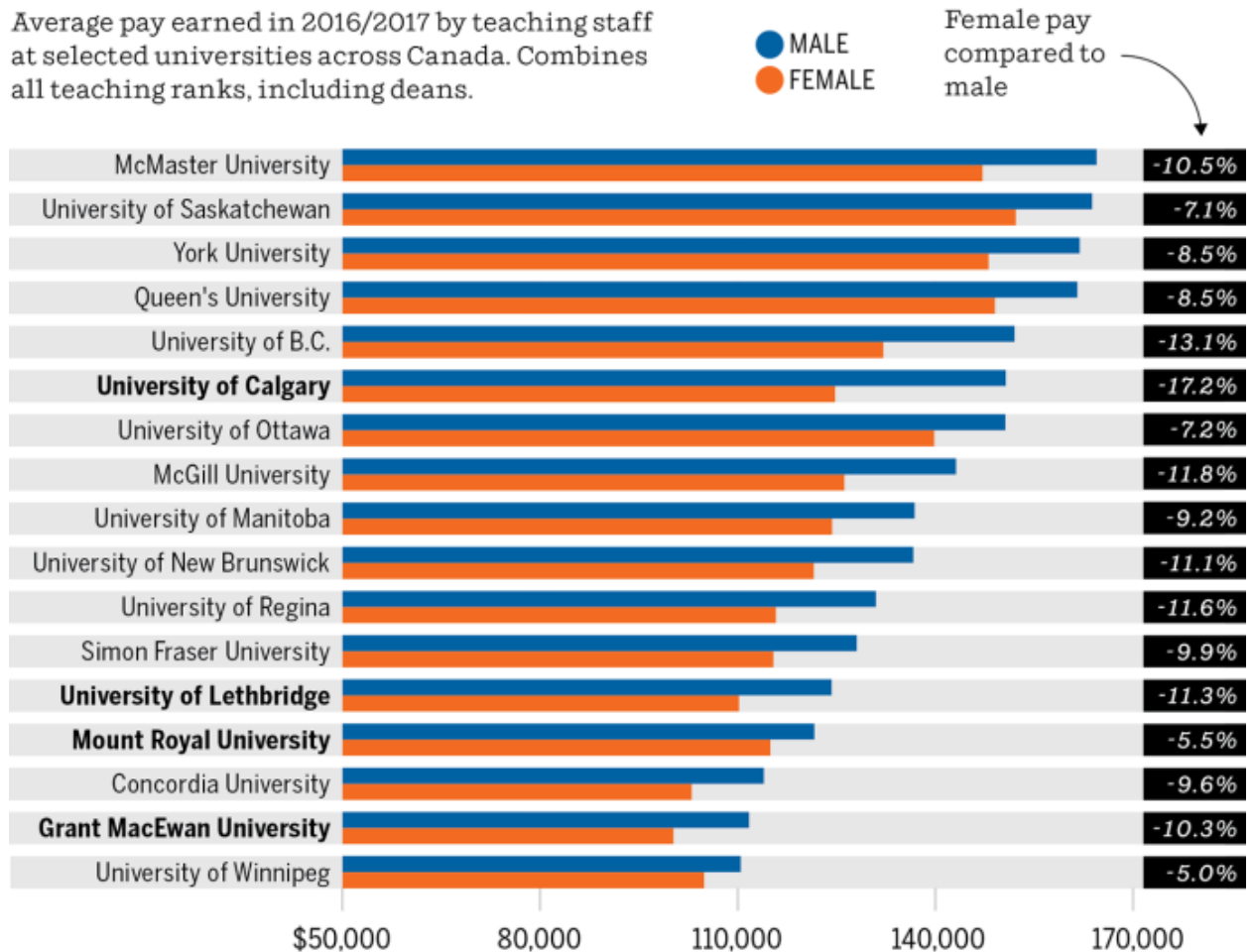
- difference if citations were a determining factor;
- o Ginther and Hayes (2003) found differences in promotion but not salary, along with differential effects of having children for men's and women's salaries and promotions;
- o Although the authors noted that a previous study found gender gaps in the field were smallest for early-career academics, Formby, Gunther, and Sakano (1993) found no gender differences in economists' starting salaries,.
- Two other studies found no significant difference without controlling for any measure of merit, and one of those studies (Torres Bernal, Le, West, & Brown, 2017) found a 12% gender difference in salary for marriage and family therapy faculty that was not statistically significant, while the other (Ferreira, 2013) looked at just one of the University of Rhode Island's campuses.

The Gender Salary Gap in Alberta/Canada: Overall, there is robust evidence of a gender wage gap in Alberta, Canada, and across North America. Reporting on the latest data from the Canadian census, Tavia Grant finds that men earned over \$20,000 more than women in 2014, and that Canada has the seventh largest gender wage inequity of all OECD countries (Grant, 2017). Furthermore, Alberta has the largest gender pay gap of any Canadian province (Grant, 2017; Lahey, 2015). These gaps have also been apparent in Alberta universities such as the University of Calgary (Kaufmann, 2017). In the academy, the evidence shows that the gender wage gaps are not solely due to differences between men and women at the point of hire, rank, productivity, or quality of work. Most of the academic salary equity studies controlled for academic rank, as well as factors like years at rank or years since PhD.

Source: Bill Kaufmann, "Experts urge Canada's universities to admit gender pay gap problem -- and fix it," Calgary Herald (April 26, 2017): <http://calgaryherald.com/news/local-news/experts-urge-canadas-universities-to-admit->

LESS PAY FOR WOMEN

Average pay earned in 2016/2017 by teaching staff at selected universities across Canada. Combines all teaching ranks, including deans.



Includes medical/dental departments, where applicable. No comparable data available for University of Alberta.

SOURCE: STATISTICS CANADA

DARREN FRANCEY / POSTMEDIA NEWS

gender-pay-gap-problem-and-fix-it

Myths About Merit: Twenty-one studies also controlled for “merit” indexes such as number of publications, number of citations, h-index, grants and awards, type of institution, and/or time spent on research — and, yet, they still found that women were underpaid relative to men despite adjusting for performance. Although controlling for merit indexes often reduced the size of the salary gap between men and women, it rarely eliminated the gap. While these studies do suggest that a portion of the salary gap may be caused by differences in academic rank, citations, publication record, and award, a growing body of research also suggests some indicators of ‘merit’ or ‘excellence’ (for example, reliance on citations) are themselves subject to gender, racial and other forms of biases (as will be discussed later). Nonetheless, even after controlling for a wide variety of merit factors, a gendered salary gap

remains that is most likely the result of unconscious bias and even discrimination. According to Valian (2005; p. 198) “the gender schemas that we all share result in our overrating men and underrating women in professional settings, only in small, barely visible ways: those small disparities accumulate over time to provide men with more advantages than women.” Indeed, there is some evidence that women see less salary benefit from certain forms of “merit” than men do. Barbezat and Hughes (2005) found that having a doctorate raised men’s salaries more than women’s. Similarly, Adjin-Tettey, Aragon, Brown, Hallgrímsdóttir, Lesperance, and Lipson (2014) found that at the University of Victoria, years of experience increased salaries for men more than women. Here, at the University of Alberta’s Faculty of Medicine and Dentistry, a study by Lacy, Kaul, and Kozyrskyi (2017) found that ‘merit’ in the form of publications and h-index correlated with salary increases only among men.

VISIBLE MINORITIES

An Academic Invisibility: There is a dearth of research on visible minorities and the racialized wage gap. This lacuna is especially evident in the academic salary literature for visible minority, Aboriginal/Indigenous faculty and faculty with visible or invisible disabilities. Thus the challenge of arriving at strong conclusions.

Outside academia, more information is available about racialized pay gaps that persist widely across Canada and North America. In Canada, the wage gap for visible minority workers exists across all education levels (McInturff & Tulloch, 2014).

The Myth of Progress: Visible minorities or racialized Canadians earn 81% the income of white Canadians, and between 2001 and 2005, racialized Canadians saw their income decline slightly. In contrast, during the same period white Canadians experienced income increases (Block & Galabuzi, 2011). Even among first-generation immigrants, white immigrants earn substantially more than non-white immigrants. The salary gap is especially pronounced for visible minority or racialized women, who earn 56% of what white men earn (Block & Galabuzi, 2011). Non-white immigrants are slower to get higher paying union jobs in Canada, and benefit less in terms of income even when they do (Verma, Reitz, & Banerjee, 2016). In the United States, the pay gap between African Americans and white Americans is now wider than it was in 1979 (Wilson & Rodgers, 2016).

Reducing Institutional Silos and Hierarchy: The literature review examined 20 articles that analyzed race or ethnicity in academic salary: five that discussed Aboriginal/Indigenous faculty, and three that mentioned disability. A significant percentage of visible minorities in the Canadian academy are Chinese and South Asian men (Li, 2012) who are located primarily in STEM (science, technology, engineering, and mathematics) disciplines (e.g. Dua & Bhanji, 2012; Henry et al, 2017). This race/ethnicity, gender and discipline dynamic tends to shape the overall wage profile of visible minorities within academia. The research in the Canadian academy also suggests significant differences among visible minority groups (CAUT, 2010; Li, 2012). For example, in its 2010 study, the Canadian Association of University Teachers found a pay gap for visible minority faculty that could not be explained solely by an analysis of qualifications:

Census data also reveal that visible minority university teachers experience an earnings gap. In 2005, all professors earned an average of about \$77,000, while visible minority

professors earned just under \$69,400, for an earnings gap of about 10% (see Table 8). This was slightly lower than the earnings gap of 12% recorded in 2000. While all visible minority groups have lower earnings than the average for all professors, some groups fare particularly poorly. Latin American professors in Canada earn just under 70% of the average, and Black professors earn just over three quarters (76%) of the average earnings of all professors (CAUT, 2010: 4-5).

In a more recent study on racialized and Indigenous faculty, Li (2012, 2017) conducted a comprehensive analysis of Canadian census data that looked at gender, race/indigeneity and their intersections (between, for example, white women, Chinese women, South Asian women, Black women, and Aboriginal women). This study found that visible minority status, Aboriginal status, and especially being both a woman and a visible minority, had a negative effect on salary. Li found that, overall, visible minority women were the most underpaid in academia. White women earned the most of all female groups, but this was still well below both white men and the average professor salary. White men earned the most in Li's analysis, followed by South Asian and Aboriginal men:

TABLE 2. Gross and Net Employment Income of University Professors, All Age Groups

<i>Visible Minority by Gender*</i>	<u>Number</u>	<u>Mean Income</u>	<u>Gross Deviation</u>	<u>Net Deviation**</u>	<u>b</u>
Male:					
White	31,895	77,148	8,243	3,431	
VM Chinese	1,665	67,726	-1,180	-5,228	
VM S Asian	1,500	75,824	6,918	483	
VM Black	750	56,194	-12,712	-9,684	
VM L American	355	51,956	-16,950	-12,475	
VM Arab	930	64,183	-4,723	-1,383	
VM W Asian	460	65,160	-3,746	-9,930	
VM Other VM	815	68,514	-392	-710	
Aboriginal	215	74,245	5,340	12,861	
Female:					
White	21,680	61,171	-7,735	-2,351	
VM Chinese	1,035	52,192	-16,713	-5,552	
VM S Asian	620	39,850	-29,056	-19,246	
VM Black	305	38,148	-30,757	-15,519	
VM L American	225	39,915	-28,991	-2,712	
VM Arab	260	38,297	-30,609	-11,982	
VM W Asian	150	38,787	-30,119	-10,953	
VM Other VM	585	48,932	-19,974	-8,059	
Aboriginal	360	47,747	-21,159	-7,526	
<i>Field of Study*</i>					
Agriculture/natural resources/food sciences	1,355	64,242	-4,664	-2,621	
Business	4,220	79,871	10,965	16,536	
Engineering/Computer Science/Architecture	7,010	73,592	4,686	5,661	
Education	6,295	52,394	-16,511	-12,048	
Health/Medical fields	4,120	84,899	15,993	24,424	
Humanities and Arts	14,780	60,824	-8,082	-7,000	
Law	1,030	91,536	22,630	30,481	
Natural Sciences	11,255	74,956	6,050	-1,003	
Social Sciences	12,100	70,625	1,719	-2,621	
Other	1,625	51,955	-16,950	-9,645	

Source: Excerpted from, Table 2 in Peter Li, "Differences in Employment Income of University Professors," *Canadian Ethnic Studies*, 44, 2 (2012): 43.

* ≤ 0.05 ** Net deviation from grand mean after adjusting for differences in other variables as listed and age as a covariate. Source: 2006 Census, Analytical File, Research Data Centre, Statistics Canada.

Most (16) of the papers analyzing racial or ethnic salary gaps in the academy were based on data from the United States, and the results across different studies revealed similar complexities shaped by which visible/racialized minority group, gender and discipline. Some findings were similar to Li's findings in Canada: Haberland & Shenhav (1990) found that African American/Black scientists earned 6% less than white scientists in the US in 1982. Ashraf (1996) found that gender and race gaps in salary existed in the US, but racial gaps decreased more over time than gender gaps did. The study also found that the biggest gender gaps were at the full professor level. Riffe, Salomone, & Stempel III (2000) found that non-white male and female faculty earned less than their white counterparts, and that non-white men out-earned non-white and white women. Faculty who worked at Historically Black

Colleges and Universities (HBCUs) in the US earned less than those at predominantly white institutions, but the gender gap was smaller at HBCUs than predominantly white institutions (Renzulli, Grant, & Kathuria, 2006).

Alternatively, some studies found salary advantages for some racialized/visible minority faculty, again likely shaped by discipline/faculty. The studies examined also suggest some changes over time and even salary decline for some racial/ethnic groups, especially when compared to others. Barbezat (1991) found that in 1984, African American/Black women had a salary boost compared to others while Black men were not significantly different from others; however, in 1989 this dynamic was reversed with Black men, but not Black women, earning more than other groups. Ginther and Hayes (2003) found that African American faculty earned slightly higher salaries than others in some models, but were less likely to be promoted. Porter and Toutkoushian (2008) found that some ethnic/racial minority faculty in the US were on average paid more than white faculty at hire, but that the advantage disappeared over time. In a review, Lee (2012) suggests that these findings maybe attributable to a supply and demand issue as a result of universities wanting to increase faculty diversity in the face of low numbers of ethnic minorities in the hiring pool.

Still other studies have found significant salary differences only for Asian faculty. Studies by Nettles, Perna, Bradburn, & Zimble (2000) and by Barbezat & Hughes (2005) found that Asian faculty (but not faculty of other racial/ethnic backgrounds) earned more than white faculty. Toutkoushian, Bellas, & Moore (2007) found that Asian faculty earned 4.5% more than white faculty when controlling for publications, and Latino/Hispanic and Black faculty salaries did not differ from white faculty's. Another study of US-based social work programs found that Asian faculty out-earned white faculty, and foreign-born faculty earned less than native-born faculty (Sakamoto, McPhail, Anastas, & Colarossi, 2008). In contrast, in the case of Canada, Li (2012) found that whether foreign-born faculty earned more or less than Canadians depended on whether the analysis controlled for individual characteristics or not.

Finally, one study examined found that there were no racial salary differences among physician researchers across the US who had been recipients of national career development awards (Jagsi, Griffith, Stewart, Sambuco, DeCastro, & Ubel, 2012).

ABORIGINAL/INDIGENOUS PEOPLES

An Absence in the Academy: Few studies have specifically looked at Aboriginal or Indigenous university employees. Sakamoto, McPhail, Anastas, and Colarossi (2008) found that Aboriginal faculty were more likely to be assistant professors or lecturers than associate or full professors, but the researchers were not able to examine salary in Canada. Dua and Banaji (2012) found an overall underrepresentation of Aboriginal faculty, and these faculty tend to be clustered in faculties of Education and Law. This is also consistent with the data at the University of Alberta, where the majority of Aboriginal/Indigenous professors are in the faculties of Native Studies, Education, and Arts. As already mentioned, Li's (2012) analysis found that Aboriginal faculty were underpaid compared to non-Aboriginal faculty.

The Canadian Association of University Teachers (2010) found that Aboriginal professors

“remain largely absent from the ranks of the professoriate” (CAUT, 1) and are the “most seriously under-represented among university teachers in Canada” (CAUT, 4). That report concluded that the employment and salary gaps were due to a number of factors, including discrimination, implicit or unconscious biases, by “patterns and practices of discrimination that limit opportunities for individuals from marginalized groups” and, more likely, as a by-product of university employment and salary structures and procedures” (CAUT, 5). The more steps on a salary structure, the more opportunities for bias and discrimination to become routinized.

Beyond the University: As is the case with visible minority groups, there is more information about Aboriginal pay gaps in non-university than in university contexts. According to the Canadian Centre for Policy Alternatives, Aboriginal workers have the largest wage gap out of the three groups discussed (the same groups as this Task Force’s report: visible minorities, Aboriginal peoples, and women), and all gaps are larger in the private sector compared to public (women and visible minorities being the other two, as with the present report; McInturff & Tulloch, 2014). The National Aboriginal Economic Development Board (NAEDB, 2015) reported substantial economic gaps between Aboriginal and non-Aboriginal Canadians; although salary gaps have narrowed somewhat since 2006, unemployment gaps have grown. Aboriginal women are particularly disadvantaged, earning less than half of what non-Aboriginal men make (Lambert, 2010; Hull, 2006).

Pendakur and Pendakur’s 2002 results, looking at data from 1971-1996, showed that a different pattern emerged in earlier years: at that time, it was also found that Aboriginal women in Edmonton were seriously disadvantaged in salary compared to other groups, even controlling for education and marital status; however, across Canada, Aboriginal men tended to experience a larger salary gap than Aboriginal women. Overall, Pendakur and Pendakur (2002; 2011) have twice found substantial earnings gaps for Aboriginal workers compared to those of British ancestry, and reported that although Aboriginal workers’ incomes rise with increased education, even those with high levels of education still experience substantial pay gaps. Even among the university-educated, wage gaps for Aboriginal workers remain large: university-educated Aboriginal workers in the private sector earn 44% less than non-Aboriginal university graduates (McInturff & Tulloch, 2014).

PERSONS WITH DISABILITIES

A Persistent Data Gap: As with visible minorities and Aboriginal/Indigenous peoples, there is a paucity of data on persons with visible or invisible disabilities generally and particularly within the Canadian university context. There is a persistent data gap on representation and on what wage gaps, if any, exist. Generally, existing literature does show a significant salary gap for persons with disabilities and this is especially true for women with disabilities. The 2015 Employment Equity Act Annual Report showed that whereas the majority of women with disabilities were in low wage brackets this was not true for men with disabilities; there was a \$10,000 wage gap between women and men with disabilities (Arim, 2012 at 21). Persons with disabilities earn significantly less than persons without disabilities, and this is particularly true for women with disabilities (Human Resources and Skills Development Canada [HRSDC], 2011 at 26). Using data from the 2006 Census, Gunderson and Lee (2016) found pay discrimination against workers with disabilities in Canada, even against those whose disability did not affect their work performance. In one exception, a study by Ornstein (2004) found that University faculty with disabilities were paid more than other faculty in Library Science.

C. FACTORS THAT SHAPE SALARY AND OTHER (IN)EQUITIES IN UNIVERSITIES

Most Canadian universities, including the University of Alberta, evaluate faculty based on three major areas of performance: research and publications, teaching and graduate and postdoctoral training, and service and administration (departmental, university and professional). Fewer universities, or units within universities, include community engagement as a fourth area of faculty evaluation. Where some universities compensate faculty with “across the board” salary adjustments, others like the University of Alberta evaluate faculty for “merit increments.” The definition of merit is often opaque, rarely defined, and often challenged for bias and inconsistencies in interpretation and application.

A False Dichotomy Between Excellence and Merit: Until relatively recently, and with few notable exceptions (e.g. University of Toronto’s December 2006 “Statement on Equity, Diversity and Excellence”), Canadian universities attempted to draw a sharp distinction between equity and merit or excellence. This distinction, which falsely implies greater equity corresponds to less excellence, is especially evident in debates on hiring and the salary gap. As an extensive body of research in higher education in Canada and elsewhere now shows, this false distinction between equity and merit often masks systemic inequities, implicit biases, and overt and covert discrimination in Canadian universities.

This dichotomization of equity and merit is also untrue. Two years ago, a study showing that STEM faculties revealed a hiring preference for women over men made headlines (Williams, Ceci, & Stephen, 2015). Some used this finding to argue that efforts to improve the outcomes of equity-seeking groups constitute “reverse discrimination” and may undermine the merit of institutions in which they are implemented (Wente, 2017). A follow-up to that report showed that this is not the case: the preference for female over male job applicants was found only in cases where the qualifications of both job candidates were exactly equal, so that a woman who was slightly-less-qualified than a man would not be hired over him (Williams & Ceci, 2015). This study concluded that equity measures are not likely to result in less qualified individuals getting jobs.

The false dichotomy between equity and merit also tends to fuel and reinforce common myths and misconceptions about women, visible minorities, and Indigenous peoples. Common myths about wage gaps often reflect patterns of historical and systemic inequities, implicit biases, negative and positive stereotypes, and deficit thinking that suggest any hiring or wage disparities are accidental, isolated or somehow the fault of underrepresented groups. Often stereotypes and implicit biases lead to claims that underrepresented groups may have lower salaries because they work less hard or are less talented and ingenious than white men.

(In)Equities Begin With Starting Salaries: The literature review highlights a different reality on salary inequities: One significant factor that shapes salary is the opening offer. Many, if not most, women do not negotiate opening salaries and men are more likely to negotiate higher starting salaries based on advice they receive from their male mentors. Without accountability mechanisms at the level of chairs, deans and senior administrators salary inequities proliferate within and across academic units. Further, it is not always the case that members of equity-seeking groups do not negotiate for equitable salaries. Gerhart and Rynes (1991) found that women graduating from MBA programs were no less likely to negotiate their salaries than men, but negotiation benefitted women less than men. Furthermore, salary negotiation may backfire for women, especially in terms of their likeability,

because asking for a higher salary is inconsistent with a traditional feminine gender role (Wade, 2001). Bowles, Babcock, and Lai (2007) found that women were penalized for negotiation. Crothers and colleagues (2010) found that women faculty are no less willing than men to negotiate their salaries, although women are less willing to negotiate for a promotion than male faculty. A survey by Fractl (2016), a market research company, revealed that racial differences in comfort with salary negotiation and ever having asked for a raise were smaller than gender differences. Hernandez and Avery (2016) report that interviewers tend to expect Black job applicants to negotiate less than white applicants. This racialized expectation in salary negotiations biases the evaluations of Black job applicants who do negotiate such that the interviewers perceive any negotiations as “too intense” or “too demanding.”

On Academic Rank, Promotion and (In)Equity: Academic rank also shapes salary in the academy. The relationship between salary and rank is not always clear. Salary gaps persist in most studies even after academic rank and years of experience are controlled for, showing that seniority does not account for pay disparities between members of equity-seeking groups and other faculty. However, if discrimination occurs not just in pay but also in promotion practices, salary gaps based on seniority may still be discriminatory. A study of promotion practices in Canadian academia showed that women tended to be promoted more slowly than men across disciplines (Stewart, Ornstein, & Drakich, 2009). Ginther and Hayes (1993) also found such a difference in the humanities, with women being promoted substantially more slowly than men, even controlling for number of children and number of publications. Ten years later, the authors found that promotion was slow for Black faculty (Ginther & Hayes, 2003). One study found that gender influenced the hireability of job candidates, but not tenure decisions (Steinpreis, Anders, Ritzke, 1999).

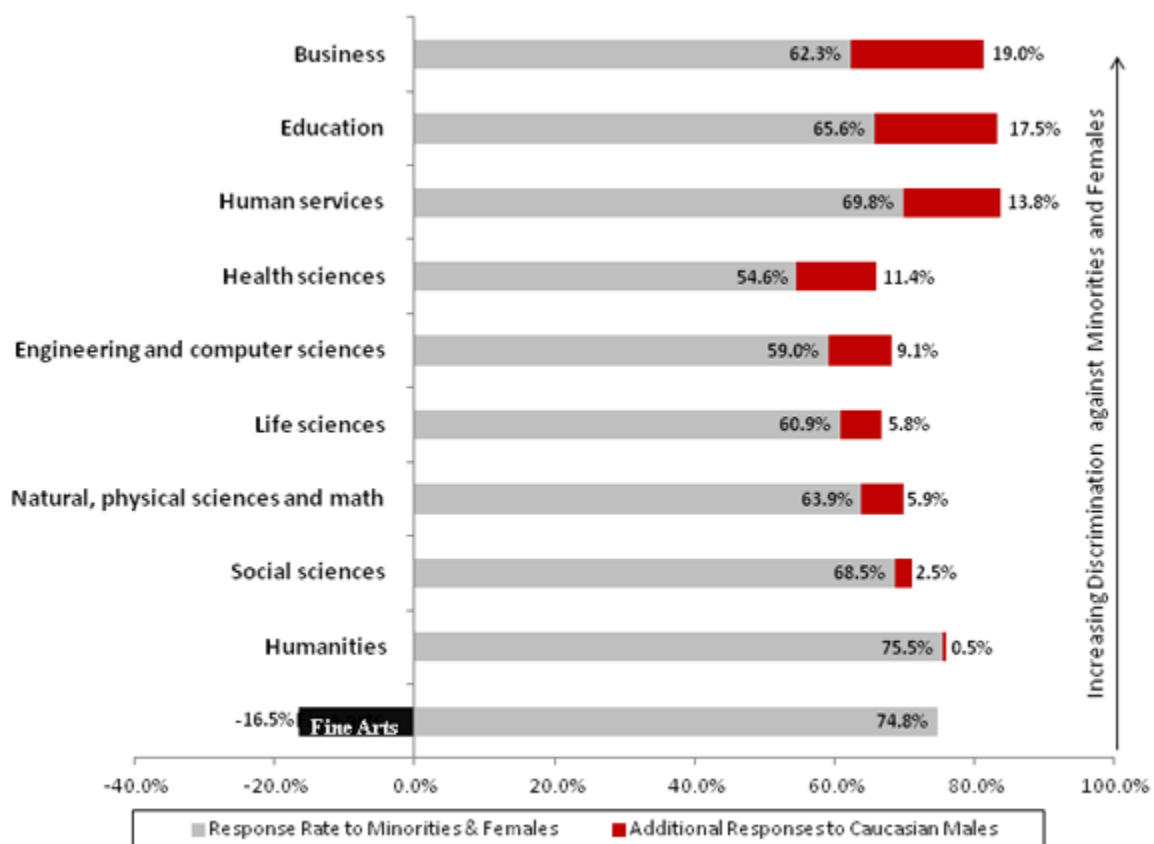
Other Factors: Lips (2013) argues against relying primarily on merit indexes when looking at gender salary gaps since these factors are often also gendered in society generally and the university specifically. Additionally, female and racialized faculty members may experience harassment, micro-aggressions, isolation, and discrimination at work, placing psychological burdens on these faculty members that most white male faculty do not have to contend with (Jakubiec, 2015; Krefting, 2013). Krefting (2013) maintains that women feel the need to continuously prove that they are skilled enough to deserve their positions, while men are free to spend their mental energy on strategic career advancement. Below we examine the literature that assesses the belief in an “ideal worker” (Carter & Silva, 2011) in general, or an “ideal academic” (Bleijenbergh, van Engen & Vinkenburg, 2012; Turner & González, 2015) in particular, assumptions about a “level playing field” and the implications of this research for equity generally, and salary equity specifically.

LETTERS OF REFERENCES, ASSESSMENTS AND PEER REVIEWS

“Unconscious Biases”: A significant body of research suggests largely unchecked historical and systemic barriers and unconscious biases shape the career and salary trajectory of women, visible minorities, and Indigenous peoples at all stages of their careers in Canadian universities. Three significant career-impacting areas where biases occur, and systemic inequities are reproduced, are in academic assessments in letters of reference, faculty evaluation, and peer reviews. Most institutions, including universities, have been slow to recognize, let alone remove, these systemic inequities and unconscious biases (Council of Canadian Academies, 2012; Duncan, 2017; Henry et al, 2017; Smith, 2017). The research also suggests that the academic work and scholarly contributions of many, although by no means all, women, Indigenous peoples, and members of visible minority groups may not be equitably recognized or evaluated fairly due to gender and racial biases that lead to

“unconscious demotions” (Wertheim, 2016; Barchas-Lichtenstein, 2017). Wertheim coined the concept “unconscious demotions” to help explain “the unthinking habit of assuming that somebody holds a position lower in status or expertise than they actually do.” In the academy this occurs in everyday biases that not only marginalize but also “demote” and devalue the contributions of women and racialized minorities.

Graduate Student Admission Bias: The biases begin early in the academic career. One study of prospective graduate students found researchers were most responsive to queries from possible graduate student mentees who were white males (Milkman, Akinola, & Chugh, 2015). With the exception of Fine Arts, these white-male biases were seen among both male and female academics and across a wide variety of disciplines, particularly business, education, health services, engineering and computer sciences, and natural, physical sciences and maths.



Copyright Katherine Milkman, Modupe Akinola and Dolly Chugh 2012

Biases in the Hiring Process: In faculty hiring bias enters the process early. One place where this occurs is in the content of letters of references. Among applicants for medical school faculty

positions, letters written for female applicants were shorter and more negative than those describing male applicants, and were also more likely to focus on teaching or the applicant's personal life rather than research or publications (Trix & Psenka, 2003). Similar results were found in geoscience, where letters for men were longer, more positive in tone, and twice as likely to be rated as “excellent” compared to letters for women (Dutt, Pfaff, Bernstein, Dillard, & Block, 2016). Researchers in psychology have found that women’s letters of recommendation are more likely than men’s to describe them as having stereotypically feminine traits such as being kind and helpful, and that job candidates whose recommendation letters described these kinds of traits were rated as less hireable (Madera, Hebl, & Martin, 2009). Though not examined by the researchers, such gendered recommendation letters could also have implications for starting salary. How a reader evaluates a letter of recommendation can also be subject to the influence of unconscious bias. Readers tend to evaluate resumés with female or African-American names less positively than male resumés or resumés with white-sounding names (Morgan, Elder, & King, 2013). Thus reference letter bias on the part of both letter-writers and letter-evaluators may influence the careers of members of equity-seeking groups.

Wennerås and Wold (1997) found that the peer review process for postdoctoral fellowship applicants was biased against women such that a woman applicant had to be more than twice as productive as a man in order to receive an equal “competence” score in peer review. Another study showed that prospective job applicants were more favorably evaluated and perceived as more deserving of a higher salary when the name at the top of the application was male (Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012).

Unequal Access to Scholarly Engagement: Studies have also revealed the prevalence of unconscious biases in professional scholarly activities that are fundamental to career advancement and salary remuneration, particularly in institutions that award “merit pay”. In one study of peer review of academic conference abstracts (using actual abstracts from an International Communication Association conference), the researchers found that when an abstract had a male name at the top instead of a female one, graduate students in communications programs perceived the abstract to be of higher quality when it related to a male-typed research specialty. The students also rated themselves as most desirous of collaboration with the author in these cases, revealing a bias in the evaluations of research authored by women in academia (Knobloch-Westerwick, Glynn, & Huge, 2013).

Biases of this sort may be particularly important in the peer review process. Helmer, Schottdorf, Neef, and Battaglia (2017) found that journal editors (of the *Frontiers* series of open-access journals) tended to be biased towards choosing manuscript reviewers of their own gender, so that male editors chose men to review manuscripts and female editors chose women as reviewers. Not all investigations into peer review have found gender bias, however: author gender was not found to significantly influence a paper’s chance of acceptance in biology (Tregenza, 2002) or a grant application’s chance of being funded (Marsh, Bornmann, Mutz, Daniel, & O’Mara, 2009).

RESEARCH, PUBLICATIONS, CITATIONS

Our literature review revealed evidence that merit indexes are constructed, interpreted and applied in ways that are not gender-neutral or race-neutral: inequities are reflected in, and reinforced by, many of the “merit” indicators that tend to be used to evaluate salary in the academy. Like the salary gap itself, these disparities may be due to implicit biases, structural factors, disciplinary

inequities, as well as discrimination in the academy and broader society.

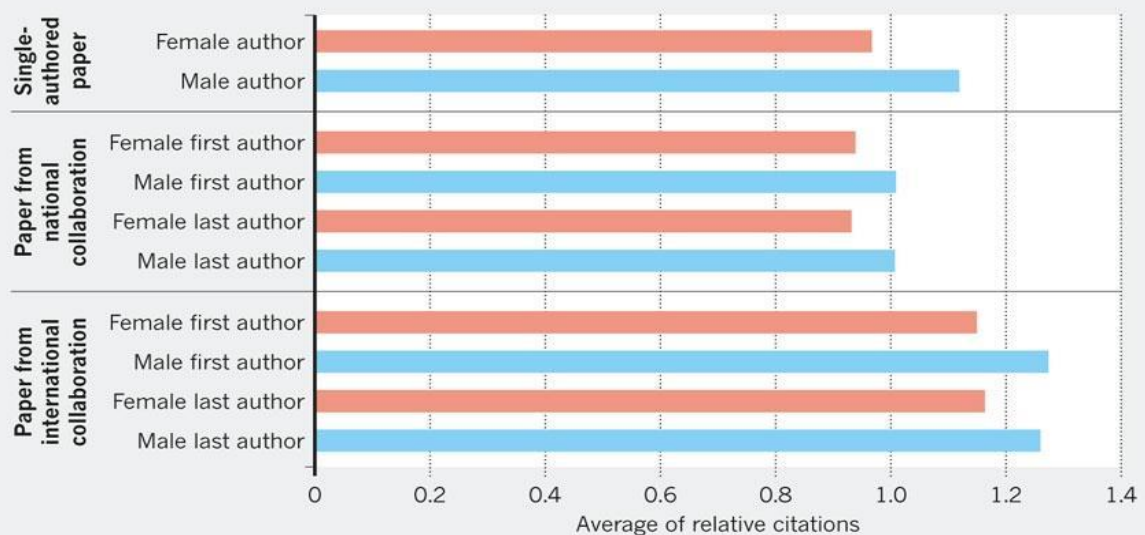
PUBLICATION RECORD

Some studies suggest there are gender differences in the number of publications by researchers and single and multiple author publications in the academy. Quantity of publications is often privileged in the academy. However, publication numbers are not an equitable measure of merit and often reflect disciplinary and methodological biases, as well as a one-size-fits-all conception of academic life and career trajectory. If the quantity of publications is the primary indicator, then several studies do suggest men publish more than women in library science (Sánchez-Peñas & Willett, 2006), ecology and evolutionary biology (Symonds, Gemmell, Braisher, Gorringer, & Elgar, 2006), most social sciences (Schucan Bird, 2011), one international relations journal (Østby, Strand, Nordås, & Gleditsch, 2013), and across many journals indexed by JSTOR (West et al., 2013). Among US academic anesthesiologists, women had lower research productivity, and this was driven by differences during early career—at mid-career, men and women were equally productive (Pashkova, Svider, Chang, Diaz, Eloy, & Eloy, 2013). It was unclear whether this early career disadvantage was due to child-rearing or some other factor that disproportionately affects women.

There is also a gender gap in terms of authorship order. Although this has been narrowing over time, gender gaps still exist in first-authorship (West et al., 2013). Even in fields where last authorship is relevant, that gender gap remains (West et al., 2013). When it comes to multi-author publication, mixed-sex authorship was found to be relatively uncommon by Schucan Bird (2011).

LEAD-AUTHOR GENDER AND CITATION

Papers with female authors in key positions are cited less than those with male authors in key positions, be they papers with one author, or those resulting from national or international collaborations.



Source: Vincent Larivière, Chaoqun Ni, Yves Gingras, Blaise Cronin & Cassidy R. Sugimoto, "Bibliometrics: Global gender disparities in science," *Nature* (December 11, 2013): <http://www.nature.com/news/bibliometrics-global-gender-disparities-in-science-1.14321#/chart>

H-INDEX AND CITATION BIASES

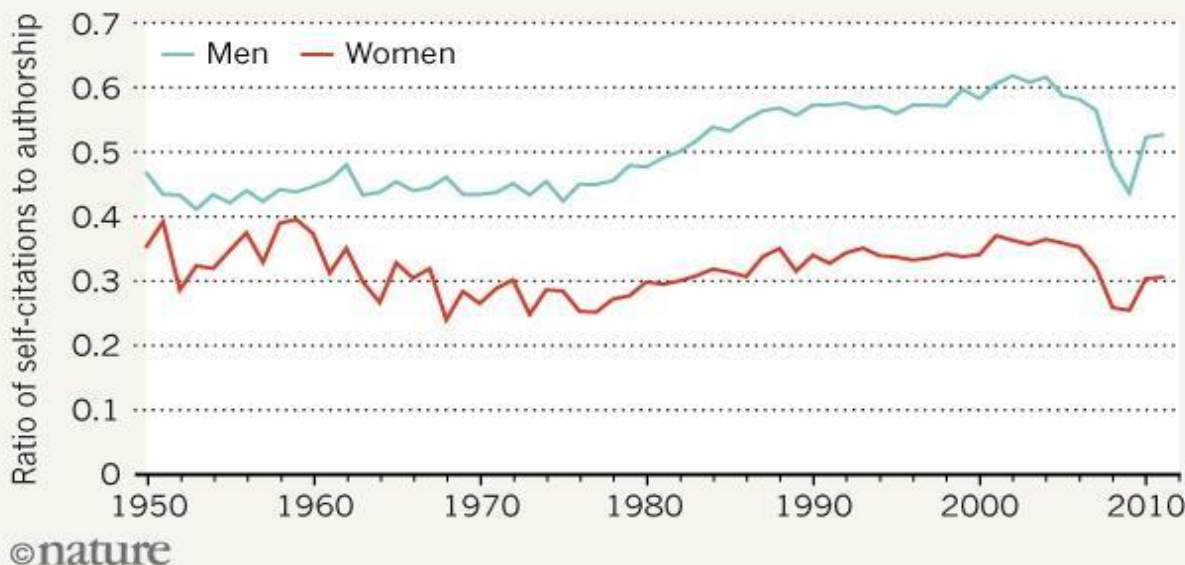
The h-index is a measure of how well-published and well-cited a scholar is — for example, an h-index of 25 indicates that a researcher has at least 25 papers that have been cited a minimum of 25 times. Although many researchers and institutions are highly supportive of the h-index (e.g. Gast, Kuzon, & Waljee, 2014), other scholars have pointed out problems beyond its implicit gender bias. For example, different search engines may return very different h-index values for the same researcher (Meho & Rogers, 2008). Others have argued that the h-index is not indicative of researchers' potential in certain fields such as applied research (Imperial & Rodriguez-Navarro, 2007). In a review, Barnes (2014) enumerates a number of problems, including that the h-index is biased against early career researchers, does not account for multi-authored papers any differently from single-authored ones, is difficult to compare across disciplines, is insensitive to very highly cited articles, and has questionable predictive value. It may also be biased through strategic self-citation (Bartneck & Kokkermans, 2011).

Studies have found that women have lower h-indexes than men, perhaps because h-index is highly correlated with total number of publications (Kelly & Jenisons, 2006; Pashkova et al., 2013). Although h-index is increasingly used as a measure of scholarly merit in salary negotiations and promotion decisions (Barnes, 2014), some authors argue against using h-index because it is less useful with early career researchers and because of gender disparities in the h-indexes of men and women (Way, Larremore, & Clauset, 2016). Despite the well-documented problems of the h-index it continues to be used by universities to measure and evaluate scholarly productivity, prestige and, in some universities to assign "merit increments" that widen the salary wage gaps. "Performance metrics based on values such as citation rates are biased by field, so most measurement experts shy away from interdisciplinary comparisons. The average biochemist, for example, will always score more highly than the average mathematician, because biochemistry attracts more citations" (Van Noorden, 2013).

The h-index is not relevant across disciplines and is more prevalent in STEM disciplines, which continue to be male-dominated. As well, recent research has highlighted the tendency since 1960 for male scholars to self-cite, and often share professional networks that cite each other (King, Bergstrom, Correll, Jacquet, & West, 2016).

SELF-CITATION RATES

Men have had a consistently higher rate of self-citation in publications than women starting in the 1960s.



Source: Dalmeet Singh Chawla, "Men cite themselves more than women do," *Nature* (July 5, 2016): <http://www.nature.com/news/men-cite-themselves-more-than-women-do-1.20176>

Even after controlling for many other factors, women in astronomy and international relations were found to be under-cited (Caplar, Tacchella, & Birrer, 2016; Malinak, 2013). Men in library science were also better cited than women, but the difference was not statistically significant (Sánchez-Peñas & Willett, 2006). Østby, Strand, Nordås, and Gleditsch (2013), on the other hand, did not find evidence of citation bias in biology.

Evidence also suggests that authors are more likely to cite others from within their own ethnic group; Greenwald and Schuh (1994) found that authors were more likely to cite other authors of the same ethnicity (Jewish or not, based on last name) as themselves. This was not due to assortment by field or citation of acquaintances' work. Stewart (2005) found that Black economists were less likely to publish in top-tier journals, which are better-cited than other journals, and that a Black-controlled economics journal was poorly cited compared to other journals. Together, this evidence suggests that how well-cited a researcher's work is may be influenced by race and gender, at least in some fields.

TEACHING, MENTORING AND TRAINING UNDERGRADS, GRADS AND POSTDOCS

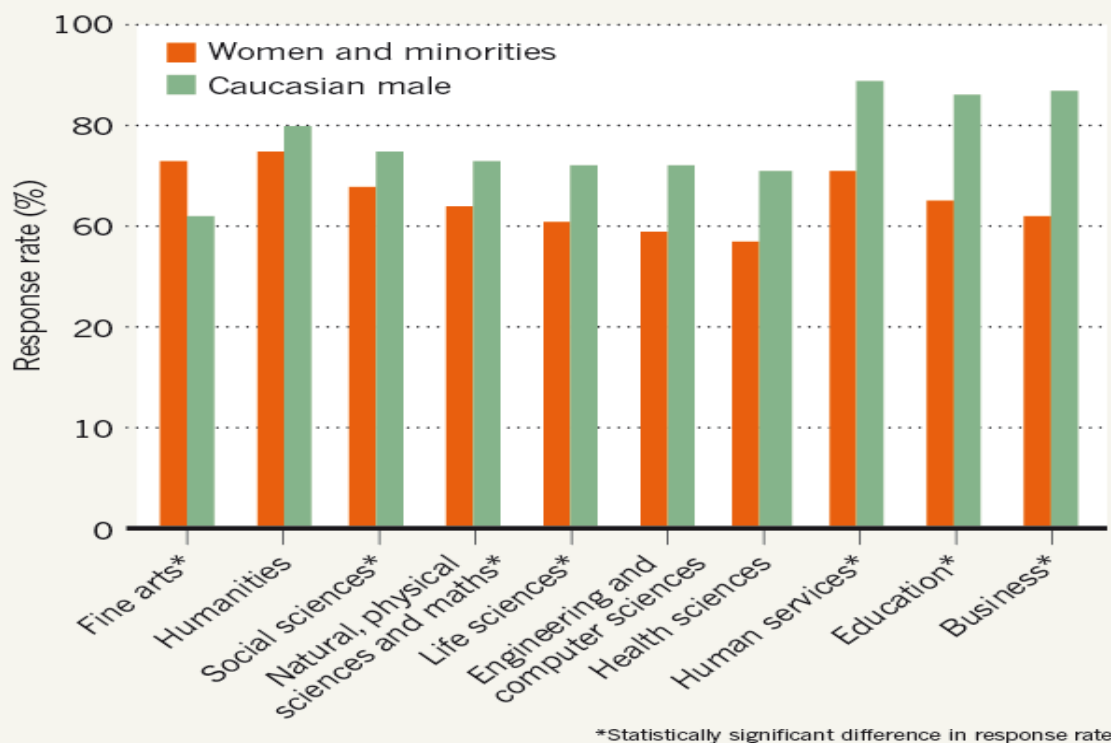
Course Evaluations Reinforce Inequities: Both experimental studies (MacNell, Driscoll, & Hunt, 2014) and studies using naturalistic data (Boring, 2017) have suggested that men receive better course evaluations than women, even if the quality of their teaching is the same. On the other hand, Ludwig

and Meacham (1997) found that although students in their study did not rate women or visible minority professors less positively in their course evaluations, they did evaluate the same course material as being more controversial when taught by women or minority faculty rather than white men. Another study found some preference for own-gender instructors in teaching evaluations, but did not account for teaching style, as the Boring and MacNell et al. studies did (Centra & Gaubatz, 2007). It should be noted, however, that teaching styles may differ by gender: Hicks and Santhanam (2002) found that female STEM lecturers tended to have more inclusive classrooms than male lecturers, for example.

Gendering and Racializing “Genius”: Teaching evaluations are also subject to gendered and racialized stereotypes about what “genius” looks like. Stereotypes associating men, but not women, with “genius” emerging as early as age 6 (Bian, Leslie, & Cimpian, 2017), and research has demonstrated that the degree to which inherent brilliance (rather than hard work) is believed to be necessary for success in a certain academic field correlates with women’s representation in that field so that women are more underrepresented in fields seen as requiring genius (Leslie, Cimpian, Meyer, & Freeland, 2015). Students are not only more likely to use words like “genius” and “brilliant” to describe men than women in online evaluations, but the frequency with which these words are used in different disciplines is also associated with the percentage of women and African American faculty in those fields (Storage, Horne, Cimpian, & Leslie, 2016). In other words, in fields where “brilliance” was often mentioned in online course evaluations, Black and female faculty members were more underrepresented.

BIASED TEACHINGS

Instructors at 259 US institutions were, on average, more likely to respond to fake email requests for mentoring if the senders' names sounded white and male.



Source: Milkman, K.L., M. Akinola, and D. Chugh. "What Happens Before? A Field Experiment Exploring How Pay and Representation Differentially Shape Bias on the Pathway into Organizations." *Journal of Applied Psychology*, 100, 6 (2015): 1678-1712: <https://www.apa.org/pubs/journals/releases/apl-0000022.pdf>

SERVICE, ADMINISTRATION, LEADERSHIP

Girl Scouts' Tax, Motherhood Penalty & Ethnic Penalty: The literature review identified a significant body of research that suggests the salaries of some underrepresented groups may be lower because they engage in service and administrative work, or community engaged scholarship, that are often undervalued (they pay a "girl scouts' tax" and "ethnic penalty"), or because maternity leave for women and child care demands impact productivity (the "motherhood penalty"). Women spend more time than men in undervalued administrative roles, which takes time away from the research activities that universities tend to value, and in some cases, slows time to promotion for women but not men (Misra, Lundquist, Holmes, & Agionavritis, 2011). Men also report spending more time on research than women, while women spent more time on teaching, mentoring, and service. Furthermore, these disparities are not the result of gendered work preferences—both men and women report a preference for spending time on research (Misra et al., 2011). This is also a significant problem for faculty who are Aboriginal or visible minority members.

Indigenous and racialized faculty are often saddled with a heavy load of administrative duties such as serving on committees and advising students as the result of their racial or ethnic group membership; these faculty are both underrepresented and seen as experts on issues relating to their ethnic and racial group memberships (Henry et al, 2017b; Joseph & Hirshfield, 2011; Monture, 2009). Black, Indigenous and other racialized faculty may also feel pressured to engage in more service and community engagement as a response to institutional or personal racism (Henry, 2012; James, 2012; Griffin, Pifer, Humphrey, & Hazelwood, 2011). This leads to heavy workloads and career disadvantage. This combination of service expectations may place an especially heavy burden on minority or Indigenous women (Hirshfield & Joseph, 2012; Monture, 2010). Faculty at the associate professor level have been found to have the lowest job satisfaction of all ranks on many metrics, especially related to service (Jaschik, 2012). Such complex factors are often represented as individual deficits rather than being recognized as institutional failures to ensure fairness and to recognize and accommodate diverse career trajectories.

Women and Visible Minorities in Canada Research Chairs: Women are grossly underrepresented as Canada Research Chairs (CRCs; Side & Robbins, 2007), and among Canada Excellence Research Chairs (CERC), 85% were white men in 2016, with other groups barely represented: 2 (8%) white women and 2 (8%) visible minority men were also CERCs (Smith & Bray, 2016). A year later, the numbers were 4% women and 15% visible minorities (Smith, Supernant, & Bray, 2017). At the University of Alberta in 2016, Smith, Supernant, and Bray found that white men still held the majority of CRCs, with only 20% held by white women, 13% by visible minority men, and 7% by visible minority women. The number of female Tier 1 chairs has actually gone down since 2009 (Smith et al., 2017). In both cases (CERCs nationally and CRCs at U of A), Indigenous scholars were completely unrepresented as CERCs and U of A CRCs in 2016, and represented only 1% of CRCs nationally (CRC, 2017). In psychology, women are found to be underrepresented at major conferences and in leadership positions despite gender parity of doctorate recipients in these fields since at least 1990 (Johnson, Smith, & Wang, 2017; Vaid & Geraci, 2016). There are no reports of CRC recipients with disabilities.

In Canada, women are underrepresented as University presidents and vice-presidents, even as compared to their level of representation as full professors (Charbonneau, 2013). In fact, the percentage of women university presidents in Canada has been hovering around one in six since the 1990s (Turpin, De Decker, & Boyd, 2014). Women are also underrepresented as presidents of Canadian colleges, but their representation there is actually better than at universities (Wiat, 2016). A study of presidential leadership teams across Canada's U15 institutions revealed these to be comprised of fewer than 40% women, and only 6% visible minorities (all men and including only three university presidents), with no Indigenous representation in any of the U15 (Smith, 2017). Representation of equity-seeking groups was also poor in chancellor, dean, and provost/vice-president positions; fewer than 30% of deans and chancellors were women, and all chancellors and over 93% of deans were white (Smith, 2017). Women's representation as deans was slightly better at 40%, but no VPs Academic are visible minorities or indigenous (Smith, 2017). Such differences may stem from the fact that qualities perceived as being associated with leadership also tend to be stereotypically associated with masculinity (see, for example, Guillaume & Pochic, 2009). Many scholars have expressed concern about the seemingly stalled progress of women in leadership roles at Canadian universities, arguing that more initiatives are needed to promote an increase in diversity in leadership positions (Chiose, 2016; Tamburri, 2016; Timmons, 2016). When women are chosen for leadership positions is also important: according to one study, women leaders are more likely to be chosen for precarious leadership

situations that involve an organization in crisis or in decline, potentially setting up women leaders to fail (Haslam & Ryan, 2008) although a different study found that female CEOs were not likely to be appointed during times when stock prices were declining (Adams, Gupta, & Leeth, 2009). Furthermore, women who did hold leadership positions at Canadian universities reported experiencing discrimination in those roles (Jakubiec, 2015).

THE DURABLE INEQUITY GAPS IMPACTING SALARY: A SUMMARY

In summary, rather than being a potential explanation for salary inequities in the academy, merit indexes may represent the institutionalization of patterns of inequities and unconscious biases that continue to disadvantage women, visible minorities, and Aboriginal/Indigenous scholars in universities. Salary differentials cannot be explained away as the result of a lack of negotiation skills, as negotiations have not benefited all groups equally, especially women and minorities. Quantitative indicators of merit may also provide unfair levels of benefit to different groups. There is ample evidence suggesting that the work of professors who are women, visible minorities, and Aboriginal/Indigenous may have their work evaluated unfairly by other researchers in terms of peer review (although this evidence is not unanimous). It is also apparent that women tend to publish less than men, and are underrepresented in prestigious authorship orders. There is some evidence to suggest this is due to diverse factors such as the “motherhood penalty” and childcare responsibilities, the gendered nature of scholarly networks and co-authorship, biases in peer review, as well as other factors. However, as the number of publications varies systematically by gender, and women and men experience the academy differently and often inequitably, assessment practices that rely primarily on any measure of “merit” cannot be considered equitable. Women and minority professors in some fields also appear to be less well-cited than men when they do publish, and together with the use of number of publications as an index results in bias against women, and possibly bias against racialized and Indigenous scholars as well. Unconscious biases also appear to affect metrics like teaching evaluations, leadership positions, and visibility at prestigious conferences. As all of these indicators are used to make salary and promotion decisions it is likely that members of equity-seeking groups may have their salaries influenced by unconscious bias twice: once directly, and again indirectly through biased indicators of scholarly merit.

D. SOLUTIONS/INSTITUTIONAL REMEDIES

Reward the Cumulative Effects: The underrepresentation of women, visible minorities and Indigenous peoples in academia often makes it difficult to detect statistically significant salary differences between members of these groups and individuals who are not members. In the case of groups that are particularly small, such as professors who are members of Indigenous/Aboriginal groups, or persons with disabilities, differences must be extremely large to be differentiable from zero in a traditional statistical sense. However, as even small differences in pay between groups can have large cumulative effects over the course of a person’s career, it is important to note that results that may not show statistical significance can still have considerable practical significance. For this reason, some past equity studies have enacted salary equity remedies even when the differences detected by their salary equity studies were not statistically significant across all models or all departments (UC Berkeley, 2015; Simon Fraser University, 2016; Western, 2009).

ANTI-BIAS REMEDIES

Few interventions decrease implicit (unconscious) bias in the long-term, and those that do may be difficult to implement because they tend to be multi-faceted (Devine, Forscher, Austin, & Cox, 2013; Lai, Hoffman, & Nosek, 2013). However strategies for change include:

- **Make the Unconscious Conscious:** Conscious effort and strict adherence to objective, measurable criteria for hiring, promotion, and salary determinations can prevent unconscious bias from affecting behavior and creating hiring/promotion/salary discrepancies (Devine, 1989). People who assess their own thinking, unconscious bias, and evaluation process exhibit less biased decision-making (Bodenhausen, 1990; Martell, 1991). In other words, conscious effort and strict adherence to objective, measurable criteria for hiring, can prevent unconscious bias from affecting hiring behavior (Devine, 1989; Van Bavel & West, 2017). According to a salary equity study conducted at a US liberal arts institution, when care was taken to ensure that starting salaries are similar and merit increase amounts are fixed, the male salary advantage was decreased (Burke, Duncan, Krall, & Spencer, 2005).

- **Bargain for Equity:** Collective agreements can enhance and empower “equity with diversity” (Smith, 2014). For instance, the Canadian Association of University Teachers notes “Aboriginal academics, like all historically underrepresented groups, are acutely aware that the biggest equity hurdle they face involves gaining acceptance of non-traditional approaches to scholarship. CAUT’s Policy Statement on Equity enjoins associations to negotiate protections which ensure that:

“When assessing scholarship for career decisions, recognition must be given to different and diverse experiences of various marginalized groups. Diverse substantive contributions to knowledge must be welcomed in the university. Diversity demands representation of difference in terms of vision, values, cultural mores, methodologies and epistemologies in critical analysis. A first step would be incorporating this language directly into the collective agreement.” (CAUT Bargaining Advisory 32 (2010): 9)

This would enable the appropriate evaluation of academic work to include alternative publication and research along with recognition of the increased workload and obligations related to Aboriginal communities. (See CAUT “Policy Statement on Indigenizing the Academy, November 2016: 2). This is also relevant among other equity-seeking groups: see CAUT policy on “Recognition of Increased Workload of Academic Staff Members in Equity-Seeking Groups in a Minority Context.”

- **Increase Accountability:** Measures such as being asked to elaborate on an evaluation or increased accountability for one’s evaluations, including student evaluations, can decrease the influence of unconscious bias over these evaluations. People have been shown to rate letters of recommendation for women and visible minority applicants more fairly after simply being asked to write explanations for their ratings of recommendation letters before offering an admissions recommendation (Morgan, Elder, & King, 2013). Increased accountability can also decrease biased decision-making (Ford et al., 2004). This was shown by Ford et al. in their study of racial bias in hiring decisions, where bias was eliminated among participants who were

told they would have to justify their decision to a manager (2004).

- **Reward Progress Towards Equity:** This may partially explain the success of the United Kingdom's Athena SWAN program, which rewards institutions that make progress towards gender equality; being held accountable to clear equity goals at an institutional level and being rewarded for progress appears to result in positive equity outcomes, at least in the case of Athena SWAN. According to Ovseiko, Chapple, Edmunds, & Ziebland (2017), both men and women think participation in Athena SWAN positively impacts gender equality and women's careers at their universities. The website for the program states that "the research identified impact on organisational structure and culture change, with increases in the proportion of women, better representation of women on committees, improvements in the transition from postdoctoral researcher to first academic post, improved working practices to support career progression and growth in women's networking across institutions" (Equality Challenge Unit, 2017).

SALARY COMPENSATION SOLUTIONS

Many Canadian Universities have found gender-based salary inequities and have taken steps to correct these. Few, if any, Canadian universities have undertaken a review of salary inequities across all four designated groups, further leading to the invisibility of visible minorities, Indigenous peoples, and persons with disabilities. This Salary Equity Task Force is among the first to undertake a more inclusive and intersectional approach.

Canadian universities have typically used one of three types of remedies to correct salary inequity: Group salary awards, below-the-line corrections, and individual case review (see Table 1). In some cases, multiple solutions have been used together.

- Group salary awards involve compensating all members of an equity-seeking group, either by the same dollar amount (for example, salaries of all women at McMaster were raised by \$3,515) or by a percentage amount (for example, at UBC all women's salaries were increased by 2%). The amount of the award is typically based on the average salary disadvantage determined by regression.
- Below-the-line corrections involve increasing the salaries of individuals whose salary is lower than predicted by a regression analysis so that these individuals' salaries are in line with other similar faculty.
- Individual case review involves reviewing individuals' salaries on a case-by-case basis, and most typically faculty members must apply to have their salary reviewed.

IMPORTANCE OF CONTINUOUS REVIEW

At least four Canadian universities (Manitoba, York, Western, and SFU) found that salary inequities re-emerged after having been corrected in earlier years, highlighting the importance of ongoing monitoring and correction of inequities. Many Canadian universities have mandated that pay equity studies should be conducted on a regular basis, either every year, every 3 years, or every 5 years (see Table 1). Some universities have also taken steps to ensure that starting salaries of newly hired faculty remain equitable. In some universities, collective bargaining initiatives and changes to the

collective agreement have enhanced the ability to collect information and monitor salary (in)equity over time.

Table 1: Salary Equity Remedies Undertaken by Canadian Universities

University	Year	Salary Equity Remedy	Ongoing Actions
Wilfrid Laurier University	2017	Group Salary Awards by Rank	2017 Faculty Association Collective Agreement Article 22.5.2 negotiated to include Bilateral University Association Employment Equity Committee with ongoing equity, diversity and inclusion responsibilities and initiatives
Simon Fraser University	2016	Group Salary Award (Recommended)	Recommended: Salary equity studies every 3 years, increased salary transparency, an anomaly review process, studying other equity-seeking groups, equity and human rights senior administrators
McGill University	2016	Below-the-line correction	Salary equity studies every year
McMaster University	2015	Group Salary Award (Percentage)	Provides job candidates with salary statistics and information about negotiating
University of Manitoba	2015	Group Salary Award	
University of Saskatchewan	2014	Group Salary Award*	
University of Victoria	2014	Group Salary Award based on experience thresholds from regression analysis of experience and pay	Recommended: another salary equity study in 3-6 years
McMaster University	2014	Individual Case Review	Proposed Vice Provost (Equity and Inclusion)
York University	2013	Below-the-line correction	
University of British Columbia	2012	Group Salary Award (2%)	Starting salary guidelines, equity initiatives, appointed Assoc VP Equity & Inclusion (2015)
University of Toronto	2011	Below-the-line correction*	Has a VP Human Resources and Equity
University of Calgary	2010	Individual Case Review	Has an Advisor to the President on Women's Issues, ongoing provision for salary anomaly review. Collective agreement includes information sharing
University of Western Ontario	2009	Below-the-line correction	Salary equity studies every 5 years

University of Waterloo	2009	Individual Case Review followed by a Group Salary Award (Recommended)	Recommended: Salary equity studies every 5 years
University of Lethbridge	2005	Individual Case Review	Salary equity studies "at regular intervals"
University of Windsor	2004		Salary equity studies every year
Queen's University	1995	Below-the-line correction	There should have been another in 2016

*This information is based on a secondary source and could not be confirmed based on the university's publicly available materials.

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Gaps in Professorial Compensation by Gender, Visible Minority, and Indigenous People at the University of Alberta

An Analysis Using the 2015 Compensation Disclosure Data

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Executive Summary

This document summarizes an analysis of the University of Alberta's 2015 Compensation Disclosure List data for the professoriate (including Deans) that was conducted for the 2017 Association of Academic Staff University of Alberta's (AASUA) Task Force on Salary Equity.

- Data from the 2015 Compensation Disclosure List was linked with the 2014-2015 Continuing Academic Staff List to create a dataset based on Assistant Professors, Associate Professors, and Professors, who may or may not also have leadership roles (i.e., Associate Chair, Chair, Associate Dean, Vice Dean, Dean), and who did not have an MD listed on the Continuing Academic Staff List. After linkage, 1,008 individuals were included for analysis, representing about 61% of the professoriate.
- Of the 1,008 individuals, there were 300 women and 708 men overall, of whom 193 were visible minority women and men, and 8 Indigenous women and men. There were fewer women, visible minority, and Indigenous people at the Professor rank than other ranks.
- The median compensation was \$14,782 lower for women than for men (average was \$18,504 lower). There was no evidence of a statistically significant difference among median compensation for visible minority, Indigenous people, and white groups, when adjusted for the gender difference.
- In regression modeling, gender differences were present even when models adjusted for degree, year since hire, rank, and years at rank. When Faculty (School, Campus) was included in the model, the estimate for gender was not statistically significant. The final model had several statistically significant interactions, meaning the effect of an explanatory variable on compensation changes depending on whether the individual is a woman and/or a visible minority. There was considerable variation in compensation and there may be other explanatory variables that could enhance the model fit.
- In the Oaxaca-Blinder decomposition analyses, similar themes emerged with a women – men gender gap. While we infer that much of the gender gap in salary can be accounted for by differences in observed characteristics between women and men, we find significant evidence of an important gender difference in the promotion process.
- When the data on 819 individuals without leadership roles were examined, the same general findings applied. For these data, the median compensation was \$12,796 lower for women than for men (average was \$15,821 lower).
- The 2015 Compensation Disclosure List represents a biased sample as it only includes individuals with > \$125,000 whom were not exempted from disclosure and represents more individuals at the Professor rank than other ranks. Further, the reported compensation may be an under representation of true salary because of sabbaticals, leaves, partial year employments, and other reasons.
- Given these data and the analyses, some evidence of compensation inequity was found. A definitive answer on compensation equity warrants further investigation with non-publicly available data.

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1 Introduction

In 2017, the Association of Academic Staff University of Alberta (AASUA) struck a Salary Equity Task Force with the mandate to

*investigate, on behalf of the Association, salary inequities, if any, that currently exist for members of the academic staff who are women, members of visible minority groups, Indigenous peoples (First Nations, Métis, and Inuit), or persons with disabilities with the goal of developing for the Association recommendations on how these inequities should be addressed.*¹

This document summarizes an analysis of 2015 Compensation Disclosure List data for the professoriate (including Deans) that was part of the Task Force's activities.

The objective of this study was to identify and quantify any differences in compensation in 2015 for women, visible minorities, and Indigenous peoples in the professoriate at the University of Alberta using publicly available data. The analysis does not include persons with disabilities because data on disabilities are not publicly available.

We describe the data sources in Section 2 and the resulting datasets for analyses in Section 3. Two datasets were used: one that included the professoriate with leadership roles up to and including Deans and one that did not include those with leadership roles. The statistical methods are described in Section 4. Results for the two datasets are contained in Section 5 and 6. We provide a discussion in Section 7 and a conclusion in Section 8. Additional materials are provided as Appendices.

2 Data Sources

We used two publicly available data sources to create linked data for analysis. The details of the Compensation Disclosure List are described in Section 2.1 and the details of the Continuing Academic Staff List are described in Section 2.2. The process to determine women, visible minorities, and Indigenous peoples variables is described in Section 2.3.

2.1 Compensation Disclosure List

On July 1, 2016, the University of Alberta released the 2015 Compensation Disclosure List² in compliance with the Alberta government's Public Sector Compensation Transparency Act.³ This list included all employees of the University of Alberta with a total compensation and severance that exceeded \$125,000

in 2015. Individuals who exceeded threshold could be exempted from compensation disclosure “only if this could unduly threaten their safety”.⁴ The list also included members of the Board of Governors.

The Compensation Disclosure List disclosed the name, position, compensation, non-monetary benefits and severance. The 2015 Public Sector Compensation Disclosure website for the University of Alberta provides a link to a downloadable csv file, however, this downloaded file has all names replaced by “University of Alberta”. Therefore, in order to obtain the compensation disclosure data, the 76 website tables containing 1,503 individuals had to be individually copied and pasted into Excel spreadsheets and combined together in the statistical software package R⁵ to form the Compensation Disclosure List dataset for analysis. The name data were split into last name and first name (or first name and initial) fields to enable data linkage.

Only individuals with compensation > \$125,000 in 2015 were retained for analyses (i.e., individuals with compensation ≤ \$125,000 but who had a severance that meant compensation plus severance exceeded \$125,000 were removed) yielding 1,477 individuals.

2.2 Continuing Academic Staff List

The University of Alberta includes lists of full-time continuing academic staff as part of its Calendar. The most recent posting corresponding to the 2015 Calendar year provided continuing academic staff for the 2014-2015 year.⁶ The Continuing Academic Staff List includes “employees whose contracts of appointment are under one of the Board-AASUA Agreements, viz. Faculty, Administrative and Professional Officer, Librarian, or Faculty Service Officer.”⁶ The List includes 2014-2015 ranks but not promotions that took effect in the 2015-2016 year and does not include appointments taking effect in 2016-2017. The List provides the employee’s last name, first name and initial, degrees (institution of degree), position, department or unit, year of first appointment to the University of Alberta, and the year of attainment of the current rank

The R statistical package was used to read the 2,880 entries on this website. Data were extracted from these entries and separated to become individual fields for last name, first name, first name and initial, PhD indicator, LLB indicator, MD indicator, rank, department or unit, year of first appointment, and the year of attainment of the current rank. The website entries were not always formatted in a regular manner (e.g., sometimes Department was listed, sometimes Faculty was listed; variants in the use of “Department of” or “of”; spelling mistakes) and the records were checked for any errors and formatting rectified. Only PhD, LLB, and MD degrees could be reliably extracted from the Continuing Academic Staff List. There may be some professors who had PhD equivalents that could not be included in this analysis (e.g., PharmD). Based on the Department data, the Faculty of the individual was determined and indicators for each Faculty were created. In the event that an individual had appointments in more than one Faculty, multiple Faculty indicators were set to 1. Indicators for type of professor (i.e., Assistant,

Associate, Full) were determined from the description of position and indicators were also created for leadership roles (i.e., Associate Chair, Chair, Associate Dean, Vice Dean, Dean, Vice President, Vice Provost, Deputy Provost, Provost) if the entry had any of these roles stated. The position data from the Continuing Staff List was used rather than the position data from the Compensation Disclosure List because of known errors in the reporting in the Compensation Disclosure List.

The Continuing Academic Staff List was merged with the Compensation Disclosure List based on last and first names and 1,506 were merged. There were three individuals who had more than one merge but further examination identified the correct linkage. Merges were also conducted using variants of the last name, first name, and middle initial as some names inconsistently reported in both data sources and some individuals had an initial as a first name. Direct examination of these entries and examination of other webpages helped determine the correct linkage. The final linked dataset had 1,350 entries.

2.3 Women, Visible Minority, and Indigenous People

For each individual on the final linked dataset, women, visible minority, and Indigenous status were determined based on publicly available biographical information, using a keyword search on google.com (e.g., photos, online profile, CV) by a research assistant (YL) and cross-checked by two of the co-chairs. The keywords used were selected from the combinations of the person's title, first and last name, middle name/initial, faculty, department and "University of Alberta". If the person's gender could not be identified through photos, it was inferred from the pronouns used on ratemyprofessors.com comments, and/or from gender indicative first name, and authors' personal knowledge. Visible minority status was determined by visible features on photos, the person's first and last name's origin, location of first undergraduate degree, and self-disclosure of ethnic origin. Last names for women were not used as a source to determine visible minority status. Two methods were used to determine Aboriginal/Indigenous peoples on the University of Alberta's 2016 Compensation Agreement List. First, we drew upon the University of Alberta's annual Employment Equity survey data for 2015, in which 17 individuals self-identified as "Aboriginal". Second, given the relatively small numbers of Aboriginal professors involved we were able to systematically review the publicly available biographies on the University of Alberta website for "self-identified" Aboriginal professors.⁷ Most, although by no means all, Aboriginal scholars tend to provide their Indigenous nations and territory in their biographical information. Dr. Mumtaz and Dr. Smith flagged potential errors based on an analysis of the person's photo, name, biographical profile, and C.V.

Note that no data was collected regarding persons with disabilities as there were no publicly available records of disabled professors at the University of Alberta. Therefore we were unable to meet the mandate on this category of individuals.

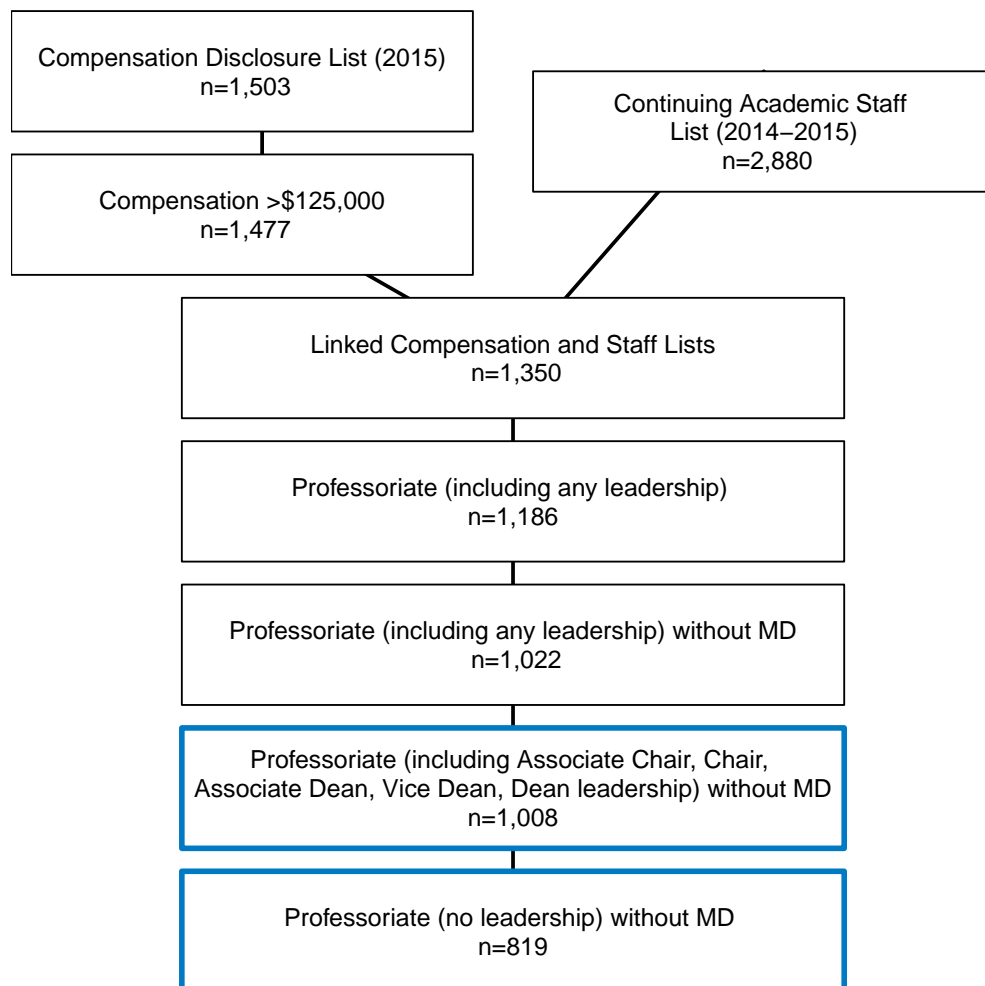
3 Datasets for Analyses

The final linked dataset was used with additional criteria to determine the datasets for analyses (number= $n=1,350$, Figure 3.1). We first selected only those individuals that were listed as Assistant Professor, Associate Professor, or Professor ($n=1,186$). We next selected those who did not have an MD listed ($n=1,022$). MDs are generally compensated only partially through the University of Alberta. Their university compensation varied more widely than those of non-MD faculty members and they receive additional compensation through clinical work. Further, we selected only those who were members of the professoriate and may have had leadership roles up to and including the level of Dean ($n=1,008$).

During 2015, members of AASUA included the professoriate up to and including the Dean level. This dataset for analysis is termed the “Professoriate with Leadership” dataset. According to data collected by the University of Alberta Employment Equity Office for 2015, there were 1,649 professoriate up to and including the Dean level. Hence, the dataset for analysis represents 61.1% of the professoriate. When considered by rank, the dataset represents 10.8% (29/268) of Assistant Professors, 43.2% (230/532) of Associate Professors, and 88.2% (749/849) of Professors.

As individuals with the leadership roles Associate Chair, Chair, Associate Dean, Vice Dean, and Dean may be compensated differently, we also considered the professoriate without these leadership roles ($n=819$). This dataset for analysis is termed the “Professoriate without Leadership” dataset.

Figure 3.1: Flowchart of data sources, linkage, and cohort determination for analysis. The bottom two boxes correspond to the Professoriate with Leadership and Professoriate without Leadership datasets.



The datasets used for analysis included the multiple variables as listed in Table 3.1. Note that “White” was not a variable used in the analysis but was the label used for individuals who were classified as neither visible minorities (i.e., Visible Minority=0) nor Indigenous people (i.e., Indigenous=0).

Table 3.1: Variables used in the study.

Variable	Coding and Description
Response Variables	
Compensation	Compensation as provided in the 2015 Compensation Disclosure list
log(Compensation)	Log of Compensation
Explanatory Variables	
<i>Equity Variables of Interest</i>	
Women	1=women; 0=men
Visible minority	1=visible minority; 0=not visible minority
Indigenous	1=Indigenous people; 0=not Indigenous people
White	Neither visible minority nor Indigenous
<i>Experience-Related Variables</i>	
PhD	1=has PhD; 0=does not have PhD
LLB	1=has LLB; 0=does not have LLB
Years since hire	As of 2015, years since hired at University of Alberta
<i>Rank-Related Variables</i>	
Assistant Professor	1=Assistant Professor; 0=not an Assistant Professor
Associate Professor	1=Associate Professor; 0=not an Associate Professor
Professor	1=Full Professor; 0=not Full Professor
Years at rank	Years at current professorial rank
<i>Leadership-Related Variables</i>	
Associate Chair	1=Associate Chair; 0=not an Associate Chair
Chair	1=Chair; 0=not Chair
Associate Dean	1=Associate Dean; 0=not an Associate Dean
Vice Dean	1=Vice Dean; 0=not a Vice Dean
Dean	1=Dean; 0=not a Dean
<i>Field Variables</i>	
Faculty variables	For each Faculty, 1=appointed in the Faculty; 0=not appointed in Faculty (e.g., for Arts, 1 if person is appointed in Arts, 0 if not appointed in Arts)

4 Statistical Methods

Our analyses included describing the variables in the Professoriate with Leadership dataset with numerical and graphical summaries (Section 4.1), regression models that quantify the relationships between variables and compensation (Section 4.2), and to examine relationships using the Oaxaca-Blinder decomposition approach commonly used by economists (Section 4.3). The analyses analyses were conducted in RStudio⁸ using R.⁵

4.1 Descriptions and Basic Tests

Descriptive analyses included summary statistics (e.g., mean, standard deviation [SD], frequencies, percentages %, cross tabulations) and graphical displays (e.g., boxplots, histograms, barcharts, scatterplots) describe data. In tables, the compensation displayed is rounded to the nearest dollar. Associations between two categorical variables were assessed by chi-squared tests or Fisher's exact tests if the cell sizes were small. Averages between two groups were compared with two-sample t-tests. One-factor analysis of variance (ANOVA) was used to assess differences in averages when there were more than two groups. To compare medians, the Kruskal-Wallis test was used. A Bonferroni correction was used for any pairwise tests.

4.2 Regression Models

Regression modelling involves estimating an equation that relates a response variable y to one or more explanatory variables. We performed various linear regression analyses to gain insight on the relationship of the response with the explanatory variables:

Model M1: Multiple regression model with equity variables only (women, visible minority, Indigenous peoples)

Model M2: M1 + experience-related variables only (PhD, LLB, years since hire)

Model M3: M2 + rank-related variables (Associate Professor, Professor, years at rank) and leadership-related variables (Associate Chair, Chair, Associate Dean, Vice Dean, Dean)

- Assistant Professor was used as the baseline and if there were too few, Assistant Professor and Associate Professor categories were combined.

Model M4: M3 + Faculty variables (e.g., Agricultural, Life and Environmental Sciences; Arts; Augustana)

- Engineering was used as the baseline as it was the least related of all Faculties to the compensation outcome.

Model M5: M4 + all interactions of women with all other variables, visible minority with all other variables, and Indigenous people with all other variables + interaction of women and visible minority with all other variables + interaction of women and Indigenous people with all other variables

- The resulting model contained both three-way interaction terms (e.g., Women * Visible Minority * Professor) and two-way interaction terms (e.g., Women * Years at rank).
- Some interaction terms were not possible to include in the model because there were not sufficient data for a combination of variables.

Model M6: A reduced version of M5 that contains only terms statistically significant ($p = p\text{-value} < 0.05$) and their lower order terms.

- First, three-way interaction terms were considered for removal based on the largest coefficient $p \geq 0.05$.
- Second, two-way interaction terms were considered for removal, if not involved in a statistically significant three-way interaction term, based on the largest coefficient $p \geq 0.05$.
- Third, main effects (e.g., variables not involved in interaction terms) were removed based on the largest coefficient $p \geq 0.05$.
- Finally, any interaction terms that were no longer statistically significant during the removal of terms were re-assessed for removal in the same manner as described in the earlier three steps.
- The final model that was obtained from this removal process was referred to as a reduced version of model M5.

These models were fit using ordinary least squares (lm in R) for the Professoriate with Leadership and Professoriate without Leadership datasets. As compensation data may have extreme values that are overly influential and may be outliers, three alternative approaches were also performed that followed the same modelling strategy listed above:

1. We used $\log(\text{Compensation})$ as the response variable y . The log transformation helps to reduce the increasing variance seen in compensation but becomes less easy to interpret because additive effects on the log scale become multiplicative effects in the original scale.

2. We used Compensation as the response variable and removed large extreme values based on model with only the equity variables. The resulting dataset was used to provide models M1 to M6 as above. A value was removed based on a standard criterion of requiring both the studentized residual > 3 and Cook's distance $> 4/n$.⁹
3. Robust regression models were used for Compensation (rlm in R with the psi.huber option). In this approach, extreme values are given less weight in the regression modelling and this technique does not allow extreme values to be as influential.

The results from these alternative approaches are provided in Appendix A.2 and B.2 for the Professoriate with Leadership and Professoriate without Leadership datasets, respectively.

With the Professoriate without Leadership dataset, we also did some Faculty-specific models for Faculties with ≥ 100 individuals. In these analyses, Faculty was not a variable in the analysis so model M4 was equivalent to model M3. The results of these models are provided in Appendix B.3.

Model results were reported as estimates and associated p-values (p). R-square and adjusted R-square values were provided for all but the robust regression models. Plots of the actual response variable values against the fitted values (value the model calculates for each individual's explanatory variables) were shown.

4.3 Oaxaca-Blinder Decomposition

An Oaxaca-Blinder (OB) decomposition is a standard method for decomposing an observed salary gap between two groups into the portion that can be explained by differences in the observed characteristics of the two groups and the portion that can be explained by differences in the returns to these characteristics.^{10,11} For example, if women faculty members have, on average, been employed at the University of Alberta for fewer years than men faculty members and because salary is positively related to the number of years at the university for all faculty members, this gender difference in the average number of years at the university contributes to the gender gap in salary attributable to differences in observed characteristics. If, however, women faculty members are evaluated less favorably by Faculty Evaluation Committees (FECs) and experience smaller increases in salary with each additional year of service at the university, such a difference would contribute to the gender salary gap attributable to differences in the returns to observed characteristics.

To perform the decomposition, we estimate a pooled model of M4 including the indicator for the reference group and then estimate M4 separately for both the reference group and the equity group. For our categorical control variables, we include all categories in the regression and impose a zero-sum re-

striction on the coefficient estimates for the categories as proposed by Gardeazabal and Ugidos.¹² The decomposition was implemented in Stata using the "oaxaca" command described in Jann.¹³

5 Results of the Professoriate with Leadership Dataset

This section provides results for the Professoriate with Leadership dataset. Notably, individuals with leadership roles also have ranks of Assistant Professor, Associate Professor, and Professor so the leadership roles and ranks data are not mutually exclusive. The analyses presented include data summaries (Section 5.1), a regression model (Section 5.2), and an Oaxaca-Blinder decomposition (Section 5.3).

5.1 Characteristics of the Professoriate with Leadership Dataset

The Professoriate with Leadership dataset had 1,008 individuals available for analysis. There were 300 women and 708 men (Table 5.1), 193 were coded as visible minority and 8 were coded as Indigenous people. Most had a PhD (87.2%) and the majority were (full) Professors (74.3%). There were fewer women ($p < 0.001$) and visible minority and Indigenous people ($p = 0.003$) at the Professor rank than at the Assistant Professor or Associate Professor rank. There were 19 Deans (1.9%) and 61 Chairs (6.1%). Relatively few visible minority and Indigenous people had leadership roles. Note that in this dataset, an individual with a leadership role is also represented in the data for her/his rank. The largest Faculties represented were Arts (166, 16.5%), Engineering (118, 11.7%), Medicine & Dentistry (196, 19.4%), and Science (218, 21.6%). These Faculties differed on the proportion of women ($p < 0.001$), with fewer women in Engineering, Medicine & Dentistry, and Science. Engineering was predominately visible minority whilst the other Faculties were predominately white ($p < 0.001$).

Table 5.1 summarizes degree, year of hire, rank, years at rank, and leadership roles for the visible minority, Indigenous people, and white groups by gender. There were fewer women than men in each of the visible minority (43/193, 22.3% women) and (252/807, 31.2% women) white groups. For Indigenous people, there were 5 (62.5%) women and 3 men. There were fewer women than men at the Professor rank for the visible minority (48.8% vs 71.3%, $p = 0.010$) and white (69.4% vs 79.8%, $p = 0.005$) groups. Summaries by Faculty are provided in Table A.3 in Appendix A.1.

Overall, the average compensation was \$176,336 (median=\$160,558) for all individuals in the dataset. When gender was considered, the average compensation was lower for women than for men (\$163,340 women vs \$181,843 men, difference=−\$18,504, $p < 0.001$). The median compensation was also lower for women than for men (\$150,079 women vs \$164,861 men, difference=−\$14,782, $p < 0.001$). There was no evidence of a statistically significant difference among average compensation for the white, visible minority, and Indigenous people groups ($p = 0.146$). Indigenous people had lower median compensation than the visible minority and white groups ($p = 0.002$); however, this difference disappeared when gender

Table 5.1: Degree, rank, and leadership role by gender by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Variable	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	43	150	5	3	252	555
<i>Degree</i>						
PhD	37 (86.0%)	137 (91.3%)	5 (100.0%)	1 (33.3%)	214 (84.9%)	482 (86.8%)
LLB	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	7 (2.8%)	9 (1.6%)
Other or None	6 (14.0%)	13 (8.7%)	0 (0.0%)	2 (66.7%)	29 (11.5%)	63 (11.4%)
Year of hire, ave (SD)	2001 (6.2)	1999 (7.8)	2005 (4.1)	2005 (6.7)	1999 (7.6)	1998 (9.0)
<i>Rank</i>						
Assistant Professor	4 (9.3%)	4 (2.7%)	0 (0.0%)	1 (33.3%)	8 (3.2%)	12 (2.2%)
Years at rank, ave (SD)	4 (2.2)	5 (4.0)	-	8	5 (2.4)	4 (2.2)
Associate Professor	18 (41.9%)	39 (26.0%)	3 (60.0%)	1 (33.3%)	69 (27.4%)	100 (18.0%)
Years at rank, ave (SD)	6 (3.7)	7 (4.6)	7 (2.5)	2	7 (4.9)	7 (5.7)
Professor	21 (48.8%)	107 (71.3%)	2 (40.0%)	1 (33.3%)	175 (69.4%)	443 (79.8%)
Years at rank, ave (SD)	6 (4.9)	9 (6.5)	1 (1.4)	3	8 (6.6)	10 (7.9)
<i>Leadership Role</i>						
Associate Chair	4 (9.3%)	9 (6.0%)	0 (0.0%)	0 (0.0%)	9 (3.6%)	33 (5.9%)
Chair	3 (7.0%)	6 (4.0%)	1 (20.0%)	0 (0.0%)	17 (6.7%)	33 (5.9%)
Associate Dean	0 (0.0%)	4 (2.7%)	0 (0.0%)	0 (0.0%)	15 (6.0%)	21 (3.8%)
Vice Dean	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	6 (2.4%)	7 (1.3%)
Dean	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	4 (1.6%)	14 (2.5%)

Table 5.2: Summary statistics of compensation by gender by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Summary	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	43	150	5	3	252	555
Minimum	\$126,266	\$125,723	\$127,619	\$126,306	\$125,255	\$125,244
25th percentile	\$134,572	\$140,535	\$128,200	\$126,557	\$137,139	\$146,480
Average	\$164,519	\$173,900	\$135,374	\$174,401	\$163,693	\$184,030
Median	\$146,352	\$160,785	\$133,031	\$126,808	\$152,590	\$166,959
75th percentile	\$163,149	\$187,108	\$141,843	\$198,449	\$176,089	\$203,381
Maximum	\$546,237	\$430,853	\$146,177	\$270,089	\$360,503	\$542,706
Standard Deviation	\$70,333	\$50,991	\$8,301	\$82,868	\$37,935	\$57,094

was also considered. Table 5.2 provides the summary statistics for the six groups.

The full distribution of compensation for these groups are shown as histograms in Figure 5.1. The histograms show the number of individuals in each category (i.e., the bar at 125 shows the number of individuals with $\$125,000 \leq \text{compensation} < \$150,000$). All plots have the same y-axis and the histograms show how few individuals there are in some groups. Boxplots allow for better side by side comparison (Figure 5.2). The box shows the 25th (lower quartile) and 75th percentiles (upper quartile), with the median in the middle, and the line extends from the minimum value to the maximum value not including extreme values. The extreme values are individually plotted and exceed 1.5 times the values of the quartiles. As we can see more easily from the boxplot than the histogram, there are some individuals who have large values.

When examined by rank and leadership roles, the average and median compensation for gender by visible minority, Indigenous people, and white groups appear in Table 5.3. The same summaries by Faculty appear in Table A.7 in Appendix A.1.

The next few pages provide addition boxplots of compensation by gender and by visible minority, Indigenous people, and white groups. Boxplots of compensation by rank and leadership role appear in Figures 5.3 and 5.4. At the Professor rank, there was considerable variability in compensation for most of the groups compared with Assistant and Associate Professors. Figure 5.5 better shows how compensation varies by rank and years at rank, and for (full) Professors. Figure 5.6 shows how years at rank varies by gender, visible minority, and Indigenous people. For the five largest Faculties, the compensation by Faculty and by gender by visible minority, Indigenous people, and white groups appear in Figure 5.7 (Figure A.3 in Appendix A.1 shows the overall distributions of each Faculty).

Table 5.3: Compensation by gender by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Variable	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	43	150	5	3	252	555
Average	\$164,519	\$173,900	\$135,374	\$174,401	\$163,693	\$184,030
Median	\$146,352	\$160,785	\$133,031	\$126,808	\$152,590	\$166,959
<i>Rank</i>						
Assistant Professor	4	4	0	1	8	12
Average	\$145,385	\$205,258	-	\$126,808	\$157,055	\$171,902
Median	\$141,840	\$222,685	-	\$126,808	\$141,467	\$167,112
Associate Professor	18	39	3	1	69	100
Average	\$147,648	\$156,149	\$135,803	\$126,306	\$144,091	\$143,872
Median	\$133,869	\$131,849	\$133,031	\$126,306	\$134,622	\$135,006
Professor	21	107	2	1	175	443
Average	\$182,625	\$179,198	\$134,731	\$270,089	\$171,725	\$193,424
Median	\$154,295	\$166,414	\$134,731	\$270,089	\$162,857	\$177,227
<i>Leadership Role</i>						
Associate Chair	4	9	0	0	9	33
Average	\$137,316	\$168,990	-	-	\$155,950	\$160,503
Median	\$134,351	\$170,722	-	-	\$152,852	\$155,286
Chair	3	6	1	0	17	33
Average	\$168,535	\$250,796	\$141,843	-	\$163,482	\$209,531
Median	\$183,251	\$221,390	\$141,843	-	\$160,048	\$200,882
Associate Dean	0	4	0	0	15	21
Average	-	\$175,055	-	-	\$154,869	\$177,901
Median	-	\$181,256	-	-	\$147,477	\$162,633
Vice Dean	0	1	0	0	6	7
Average	-	\$187,207	-	-	\$174,185	\$229,276
Median	-	\$187,207	-	-	\$166,354	\$203,148
Dean	0	1	0	0	4	14
Average	-	\$203,928	-	-	\$284,725	\$281,260
Median	-	\$203,928	-	-	\$266,672	\$303,641

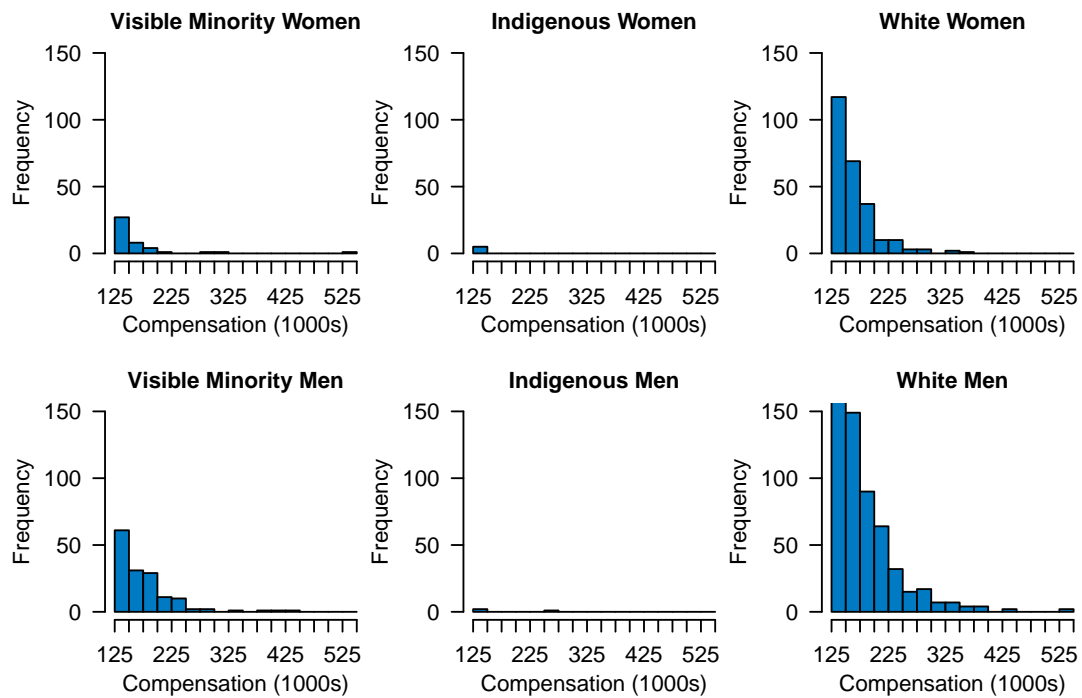
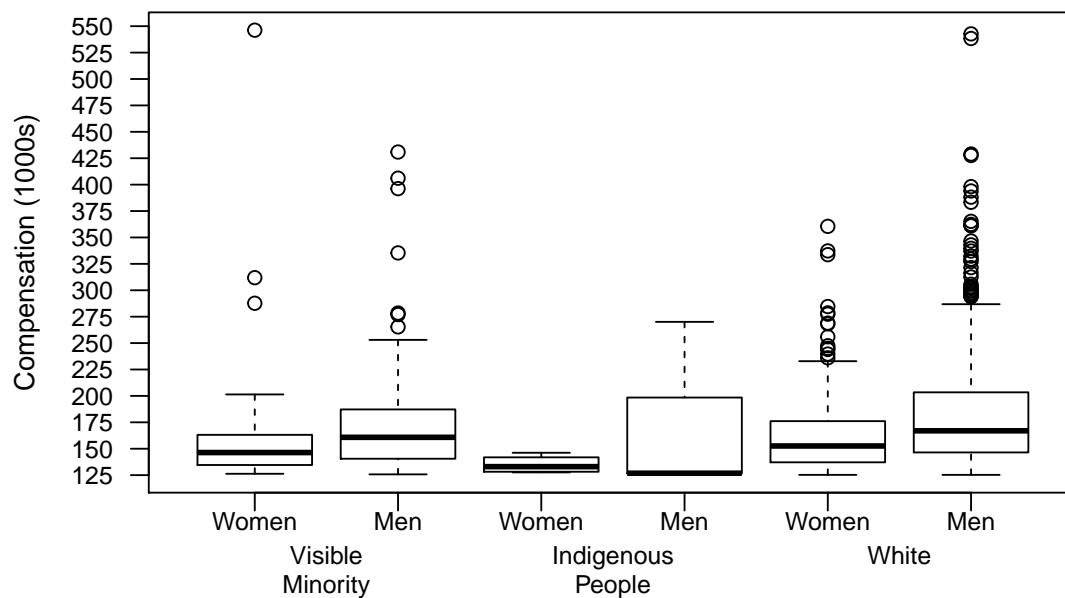
Figure 5.1: Histograms of compensation by groups for the Professoriate with Leadership dataset.**Figure 5.2:** Boxplots of compensation by gender by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Figure 5.3: Boxplots of compensation by rank and by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for the Professoriate with Leadership dataset.

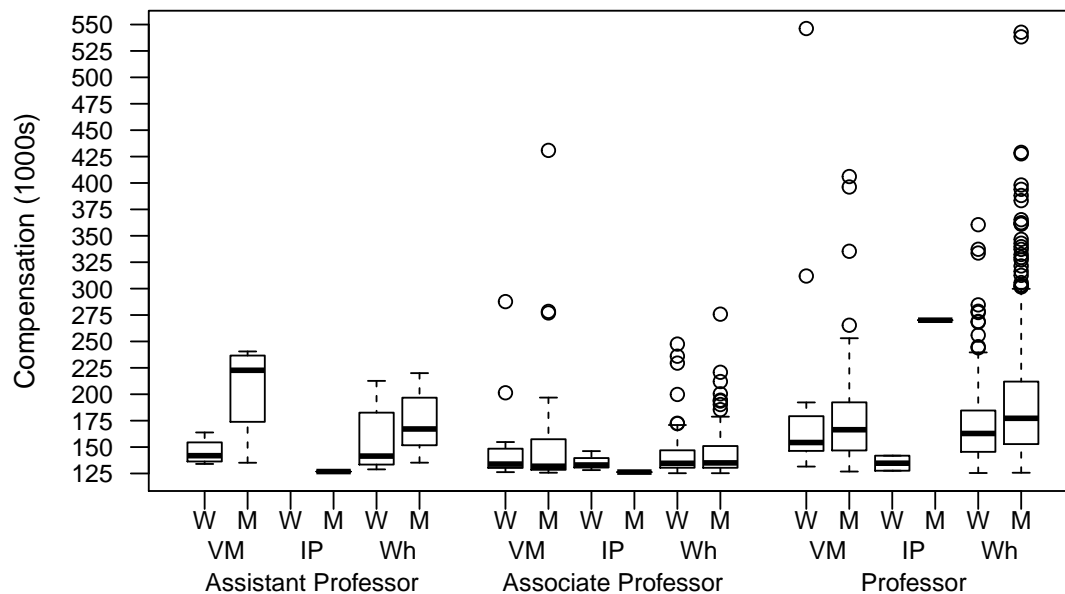


Figure 5.4: Boxplots of compensation by leadership role and by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for the Professoriate with Leadership dataset.

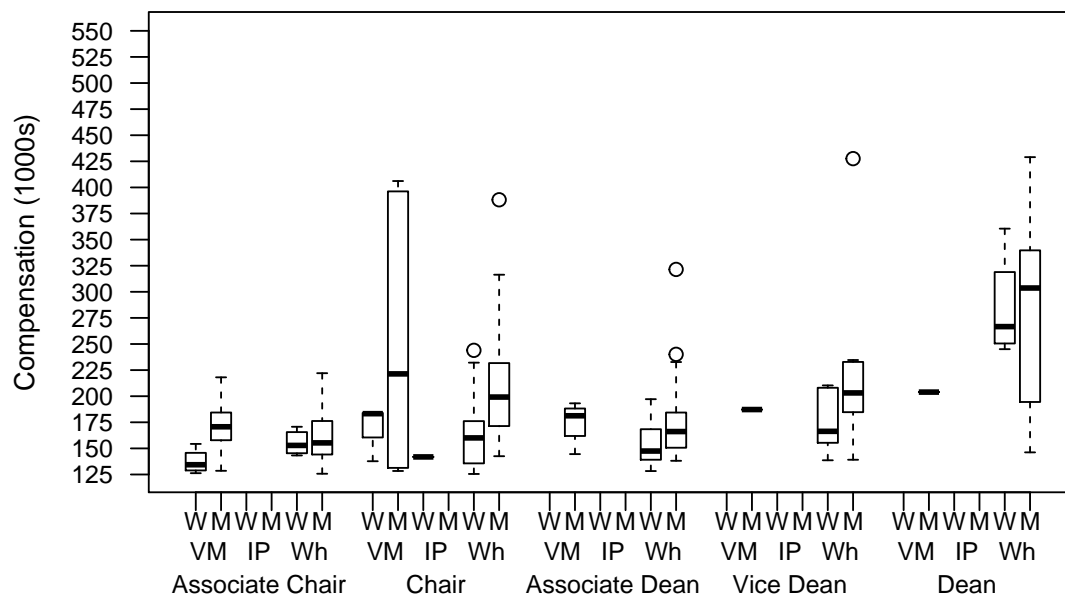


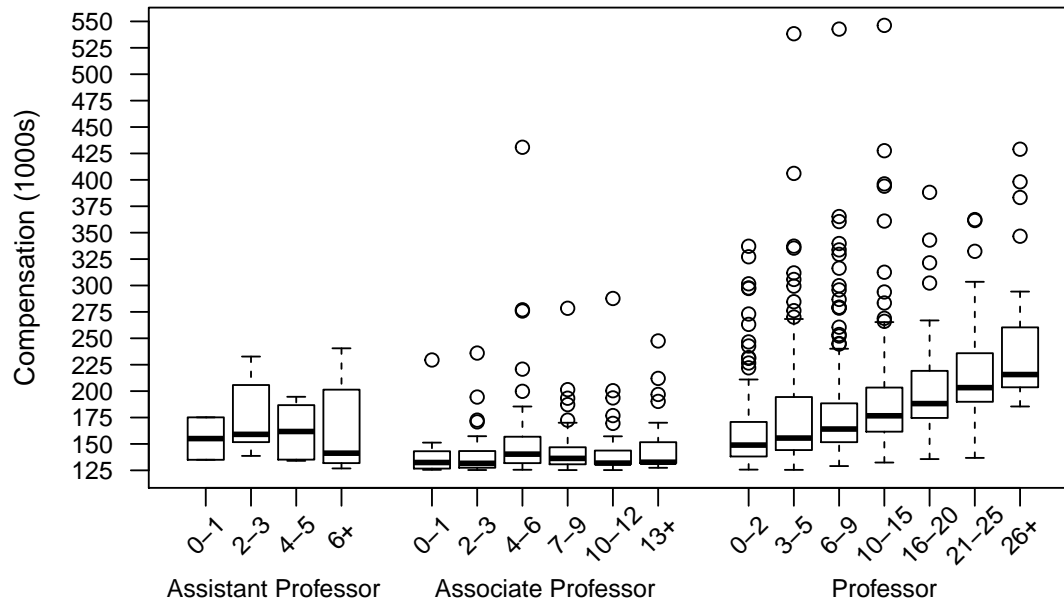
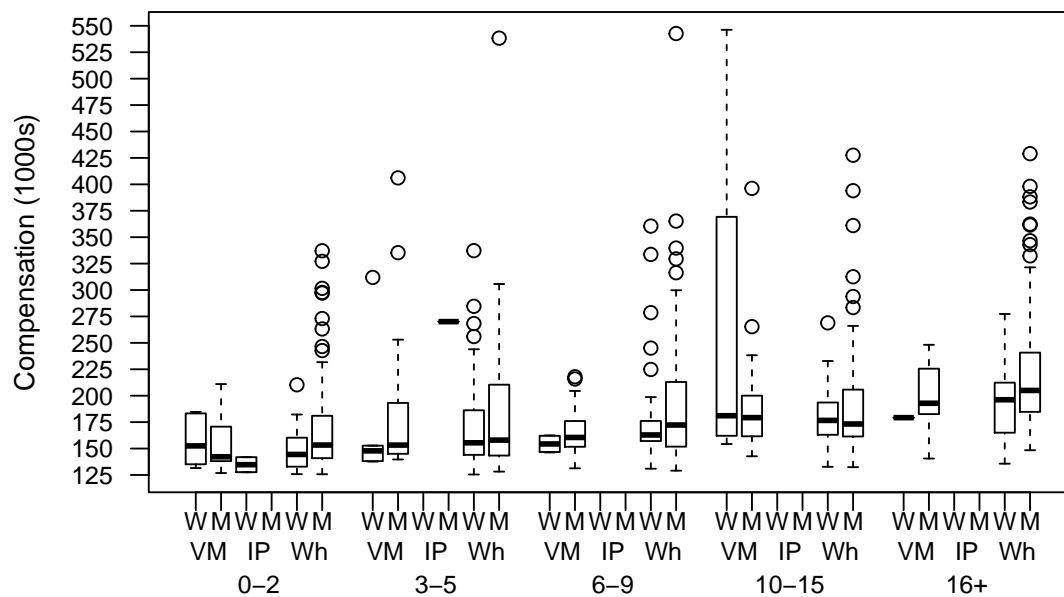
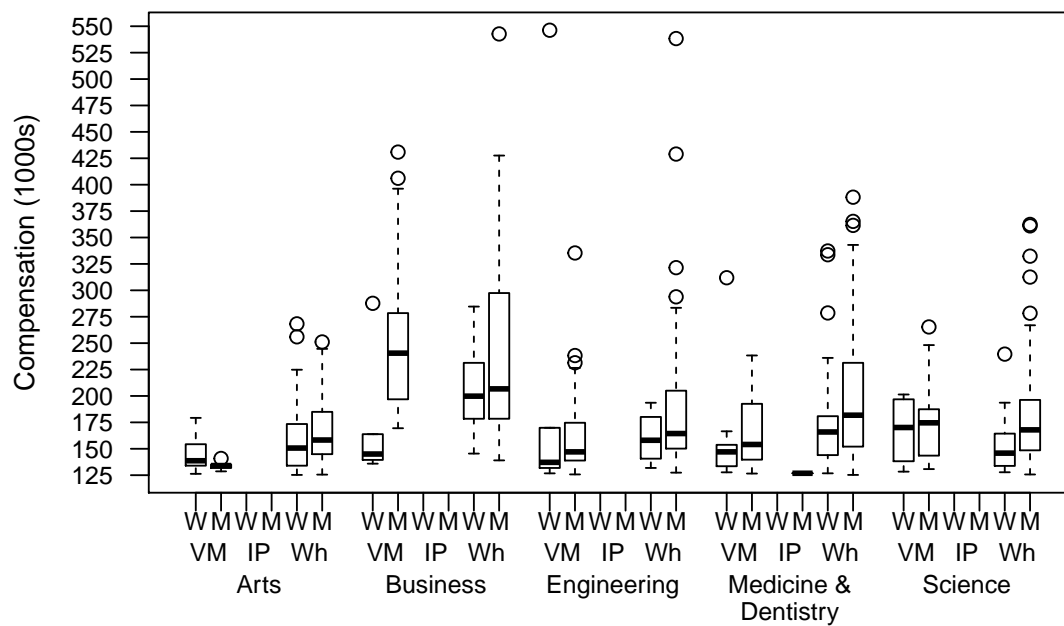
Figure 5.5: Boxplots of compensation by rank and years at rank for the Professoriate with Leadership dataset.**Figure 5.6:** Boxplots of compensation by years at rank and by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for (full) Professors in the Professoriate with Leadership dataset.

Figure 5.7: Boxplots of compensation for the five largest Faculties by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for the Professoriate with Leadership dataset.



5.2 Regression Results for the Professoriate with Leadership Dataset

Several models were fit to examine the relationship between explanatory variables and compensation using the Professoriate with Leadership dataset. The regression coefficient estimates and their associated p-values appear in Table 5.4. The cells highlighted in yellow represent statistically significant terms at the 0.05 level.

Model M1 involves an intercept as well as indicator variables for women, visible minority, and Indigenous people. The estimates provided for the coefficients form a model that can be represented as

$$\text{Compensation} = 183534 - 18750 \times \text{Women} - 7547 \times \text{Visible Minority} - 21806 \times \text{Indigenous} \quad (1)$$

where Women, Visible Minority, and Indigenous are the indicator variables (e.g., Women=1 if an individual is a woman, =0 if a man) as described in Table 3.1. With these variable codings, men who are white are the baseline. Using (1), a white man has an estimated compensation of \$183,534 (i.e., all indicators are 0) and a white woman would have an estimated compensation of $183534 - 18750 = \$164,784$. Similarly, the estimated compensations for visible minority men and women are \$175,987 ($=183534 - 7547$) and \$157,237 ($=183534 - 18750 - 7547$), respectively. For Indigenous people, the estimated compensations for men and women are \$161,728 ($=183534 - 21806$) and \$142,978 ($=183534 - 18750 - 21806$), respectively. The estimated values from the model for the combination of explanatory variables are called the “fitted” values and one approach for assessing a model is to plot the actual values against the fitted values.

The estimated coefficients have an associated p-value that corresponds to a test of whether the coefficient is statistically different from 0. For Women, the p-value < 0.001 is statistically significant at the 0.05 level and there is evidence to conclude it is non-zero. For Visible Minority, the p-value 0.075 is not statistically significant at the 0.05 level but there is weak evidence of statistical significance ($p < 0.10$). With a p-value of 0.245, the coefficient for Indigenous is not statistically different from 0. For this model, there is evidence that compensation varies by gender and weak evidence that it varies by visible minority.

One final note about model M1 is the R-square and adjusted R-square (Adj. R-square) values. The R-square represents the variation captured in the model and the adjusted R-square adjusts the R-square based on the number of variables in the model. Good models will capture more variation than poor models. For model M1, the adjusted R-square is 0.03 which means that only 3% of the variation is explained by the model. This model does not provide a good fit to the data and other variables are required to improve the model fit.

For model M2 with the addition of degree and years since hire, women continue to have a lower compensation than men and years since hire is an important variable adding \$1,250 of compensation for each year an individual has been hired, all other variables held fixed (i.e., someone hired 10 years ago would have additional compensation of \$12,500 than someone hired 0 years ago).

Table 5.4: Compensation regression models for the Professoriate with Leadership dataset.

(Total n=1,008: n=43 visible minority women, n=150 visible minority men, n=5 Indigenous women, n=3 Indigenous men, n=252 white women, n=555 white men)

Term	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	183534	<0.001	158200	<0.001	160782	<0.001	104089	<0.001			64356	<0.001
Women	-18750	<0.001	-17011	<0.001	-10146	<0.001	-2511	0.419			60418	<0.001
Visible Minority	-7547	0.075	-5077	0.224	257	0.945	-3822	0.271			55580	<0.001
Indigenous	-21806	0.245	-13166	0.475	-5456	0.740	12947	0.420			63422	<0.001
PhD			3939	0.440	3890	0.400	5185	0.226			3922	0.320
LLB			3833	0.761	-2956	0.793	-28014	0.072				
Years since hire			1250	<0.001	-769	<0.001	-927	<0.001			-1129	<0.001
Associate Professor					-24938	<0.001	23094	<0.001			53588	<0.001
Professor					8076	0.383	63159	<0.001			102651	<0.001
Years at rank					2821	<0.001	2941	<0.001			3133	<0.001
Associate Chair					-2134	0.746	5794	0.324				
Chair					23914	<0.001	26118	<0.001			23649	<0.001
Associate Dean					-23	0.998	6193	0.374				
Vice Dean					40131	<0.001	36337	<0.001			37390	<0.001
Dean					98387	<0.001	106115	<0.001			100920	<0.001
Agricultural, Life and Environmental Sciences							-12516	0.055				
Arts							-15784	<0.001			-10111	<0.001
Augustana							-27133	<0.001			-21470	<0.001
Business							82646	<0.001			101537	<0.001
Education							-17435	<0.001				
Extension							-7288	0.654				
Graduate Studies and Research							-37198	0.056				
Law							28227	0.057				
Medicine & Dentistry							17350	<0.001			25685	<0.001
Native Studies							-15461	0.491				
Nursing							1116	0.903				
Pharmacy and Pharmaceutical Sciences							-2792	0.823				
Physical Education and Recreation							-6119	0.530				
School of Public Health							22928	<0.001			28537	<0.001
Rehabilitation Medicine							-10183	0.292				
Campus Saint-Jean							-18587	0.105				
Science							-3538	0.414				
Interaction Terms:												
Women * Visible Minority											-69597	<0.001
Women * Years since hire											528	0.336
Women * Associate Professor											-51907	<0.001
Women * Professor											-74143	<0.001
Women * Years at rank											-745	0.242
Women * Business											-50173	<0.001
Visible Minority * Years since hire											1127	0.091
Visible Minority * Associate Professor											-51813	<0.001
Visible Minority * Professor											-67582	<0.001
Visible Minority * Years at rank											-1463	0.064
Visible Minority * Medicine & Dentistry											-22074	<0.001
Indigenous * PhD											-73932	<0.001
Women * Visible Minority * Years since hire											-4867	<0.001
Women * Visible Minority * Associate Professor											86504	<0.001
Women * Visible Minority * Professor											131877	<0.001
Women * Visible Minority * Years at rank											6250	<0.001
R-square	0.03		0.07		0.27		0.44		0.50		0.46	
Adj. R-square	0.03		0.06		0.26		0.42		0.44		0.44	

†Estimates not shown because of a large number of terms.

Model M3 adds in rank, years at rank, and leadership roles and explains 26% of the variation. The coefficient for Women is still negative and statistically significant. For each year at rank, an additional \$2,821 is added to the compensation and for each year of hire compensation is reduced by \$769. This result may seem counter-intuitive but years since hire and years at rank are related. Associate Professors have an estimated compensation of -\$24,938 compared to the baseline of Assistant Professor. Because of the \$125,000 threshold, the dataset is more representative of full Professors. For the professoriate with leadership roles, the individuals who are Chairs, Vice Deans, or Deans had an estimated increase to their compensation, over and above their rank, of \$23,914, \$40,131, and \$98,387, respectively.

Model M4 includes indicators for each of the Faculties using Engineering as the baseline. Compared to Engineering, the Faculties of Arts, Augustana, and Education have coefficients that decrease the compensation whereas the Faculties of Business, Medicine & Dentistry, and the School of Public Health coefficients that increase the compensation. Adding Faculty also markedly increases the adjusted R-square to 42%. With the addition of Faculty, the gender effect is no longer statistically significant although the lower compensated Faculties have higher proportions of women.

Model M5 includes additional interaction terms that allow the coefficients to vary by gender and by visible minority and Indigenous people. This model has too many terms to display and many of the terms are not statistically different from 0. Instead, we removed terms that were not important to the model and display the reduced model, called model M6. This model contains several statistically significant interaction terms. Unlike the other models where you can examine estimates individually, any term involved in an interaction must be considered with the other term in the interaction. Hence, it is best to examine the interactions first.

The Women term is involved in several interactions, including three-way interactions with Visible Minority and Years since Hire, Associate Professor, Professor, and Years at rank. For example, consider an individual in a Faculty other than Augustana, Arts, Business, Medicine & Dentistry, or the School of Public Health. The estimated compensation for a visible minority woman with a PhD who has been hired for 10 years, is 3 years at the Associate Professor rank, and does not have an additional leadership role is \$129,156 $(=(64356+60418+55580-69597)+3922+(-1129+528+1127-4867)\times 10+(53588-51907-51813+86504)+(3133-745-1463+6250)\times 3)$. A white man with all of the same characteristics would have a compensation of \$119,975 $(=64356+3922+(-1129)\times 10+53588+(3133)\times 3)$. These formulas can be tedious with all of the indicators but depending on group, coefficients are in or out of the calculation and can be simplified for the gender by visible minority, Indigenous people, and white groups. Table 5.5 shows the simplified version which has all of the calculations for the six different groups. Each group starts with a base value and then additional amounts are added depending on whether or not the individual of interest has the characteristic listed. The white male example from above is $64356+3922-1129\times 10+53588+3133\times 3=\$119,975$.

Using the model's formula and the explanatory variables for the individuals in the dataset, the fitted

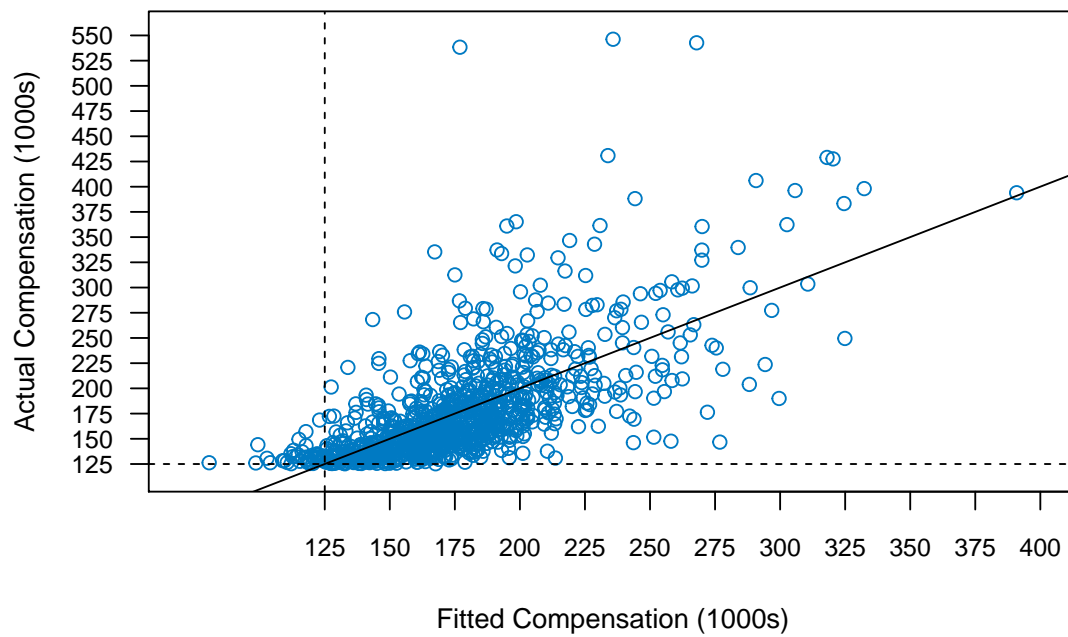
Table 5.5: Summarized regression formula for model M6 by gender by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Characteristic	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
	\$110,757	\$119,937	\$188,196	\$127,779	\$124,774	\$64,356
+ PhD	\$3,922	\$3,922	−\$70,010	−\$70,010	\$3,922	\$3,922
+ per Year since hire	−\$4,342	−\$2	−\$601	−\$1,129	−\$601	−\$1,129
+ Associate Professor	\$36,372	\$1,775	\$1,681	\$53,588	\$1,681	\$53,588
+ Professor	\$92,803	\$35,069	\$28,507	\$102,651	\$28,507	\$102,651
+ per Year at rank	\$7,175	\$1,670	\$2,387	\$3,133	\$2,387	\$3,133
+ Business	\$51,364	\$101,537	\$51,364	\$101,537	\$51,364	\$101,537
+ Medicine & Dentistry	\$3,611	\$3,611	\$25,685	\$25,685	\$25,685	\$25,685
+ Chair	\$23,649	\$23,649	\$23,649	\$23,649	\$23,649	\$23,649
+ Vice Dean	\$37,390	\$37,390	\$37,390	\$37,390	\$37,390	\$37,390
+ Dean	\$100,920	\$100,920	\$100,920	\$100,920	\$100,920	\$100,920
+ Arts	−\$10,111	−\$10,111	−\$10,111	−\$10,111	−\$10,111	−\$10,111
+ Augustana	−\$21,470	−\$21,470	−\$21,470	−\$21,470	−\$21,470	−\$21,470
+ School of Public Health	\$28,537	\$28,537	\$28,537	\$28,537	\$28,537	\$28,537

compensation values can be calculated and these are plotted with the actual compensation. Figure 5.8 show the fitted versus actual values for each individual along with the 45° line and dotted lines that show the \$125,000 threshold. Points above 45° line represent individuals who have compensation that is higher than the model would suggest and points below the line have compensation that is lower than the model would suggest. There is quite a bit of variability around the line and as the model only captures 44% of the variation, there are likely unavailable variables that would provide a better model.

There are clearly some large compensation values that may influence the regression model. The results for the alternative modelling approaches described in Section 4.2 appear in Appendix A.2. The results are different for the different models; however, all methods have statistically significant interactions involving gender, visible minority, and Indigenous people. Based on the public data and the models, compensation appears to differ by women, visible minority, and Indigenous people groups.

Figure 5.8: Fitted versus actual compensation for model M6 in Table 5.4 for the Professoriate with Leadership dataset.



5.3 Oaxaca-Blinder Decomposition for the Professoriate with Leadership Dataset

Table 5.6 reports the OB decompositions of the compensation gap between men and women (Column (1)) and between whites and visible minorities (Column (2)) including faculty members with leadership roles. An Oaxaca-Blinder decomposition of the compensation gap between non-Indigenous and Indigenous people is not possible for technical reasons related to the small number of Indigenous people in our sample.^a The first two rows in the table report the predicted salaries for the reference group and the equity group, while the third row reports the total compensation gap between the groups. Below the total gap, we report the portion of the gap explained by differences in observed characteristics between the two groups (often referred to as the "explained" portion of the gap) and the portion explained by differences between members of the two groups in the returns to characteristics (often referred to as the "unexplained" portion of the gap).^b The remainder of the table details the contributions of individual groups of controls to the "explained" and "unexplained" portions of the gap.

In Column (1), we see that the compensation gap between men and women faculty members is \$18,504 – a gap that is statistically significant at the 1% level. Of this gap, \$15,614 can be explained by differences in the average characteristics of men and women faculty members. In particular, \$5,926 of the gap results from women having, on average, having been in their current rank for about 2 fewer years than their male peers. Likewise, gender differences in rank account for \$5,059 of the total gap as 78% percent of the men in our sample are full Professors (who earn more) compared to only 66% of women. Finally, differences in the distribution of men and women across Faculties account for \$5,588 of the total gap. Together, these three differences in the average number of years at the university and rank account for a full 90% of the gender gap in compensation in our sample.

Turning to the portion of the gap explained by gender differences in the returns to characteristics, we find that only gender differences in the compensation returns to rank make a statistically significant contribution to the observed gender gap in compensation. Specifically, gender differences in the returns to rank can account for a gender difference in compensation of \$14,506. This difference implies either that women faculty members earn less as Assistant Professors when hired than their male peers or that women faculty members experience smaller increases in compensation upon promotion than their male peers. Given the small number of Assistant Professors in our sample, the latter seems more likely to be driving our estimate. Thus while we infer that much of the gender gap in compensation can be accounted for by differences in observed characteristics between men and women, we find significant evidence of an important gender difference in the promotion process.

^aThe OB decomposition requires estimating the compensation model (M4) for each group. Unfortunately, the number of parameters to be estimated in M4 exceeds the number of observations of Indigenous people ($n=8$).

^bThe "unexplained" portion of the gap also includes the effects on the compensation gap of *unobserved* differences in characteristics between the two groups-hence the term "unexplained".

In Column (2), we see that the compensation gap between white and visible minority faculty members – while economically significant at \$5,869 – is statistically not distinguishable from zero. Here again, differences between white and visible minority faculty members in years at their current rank and their distribution across ranks are the primary contributors to the observed compensation gap – collectively accounting for a compensation gap of \$7,772. In addition, fewer visible minorities (15%) serve in leadership or administrative roles than white faculty members (20%), resulting in a \$2,879 difference in compensation.

In the "unexplained" portion of the compensation gap, we find no evidence that differences between white and visible minority faculty members in the returns to characteristics account for the observed gap – at least no differences in the returns to characteristics that would tend to produce a compensation gap in favour of white faculty members. Indeed, our estimates indicate that visible minority faculty members may enjoy higher returns to working in particular Faculties and serving in leadership roles than their white peers.

Table 5.6: Oaxaca-Blinder decomposition for the Professoriate with Leadership dataset.

	Men – Women	White – Visible Minority
Differential		
Predicted compensation for reference group	181843 *** (2105)	177679 *** (1855)
Predicted compensation for equity group	163340 *** (2526)	171810 *** (4012)
Total gap	18504 *** (3288)	5869 (4421)
Gap explained by differences in characteristics	15614 *** (2726)	2745 (3054)
Gap explained by differences in returns to characteristics	2889 (3228)	3124 (3741)
Explained by differences in characteristics		
Visible Minority	-216 (270)	
Indigenous	-168 (206)	
Women		-240 (309)
Degree type	466 (402)	-797 (434)
Years since hire	-1244 (662)	-1724 * (829)
Years at rank	5926 *** (1438)	3348 * (1492)

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	Men – Women	White – Visible Minority
Rank indicators	5059 *** (1417)	4423 ** (1640)
Faculty indicators	5588 ** (2038)	-5145 (2710)
Leadership roles	204 (1086)	2880 ** (1036)
Explained by differences in the returns to characteristics		
Visible Minority	-914 (1354)	
Indigenous	597 (350)	
Women		-2946 (3844)
Degree type	10272 (9155)	621 (8230)
Years since hire	649 (11188)	-611 (15523)
Years at rank	2427 (5057)	1644 (7386)
Rank indicators	14506 * (6574)	3393 (7759)
Faculty indicators	-4114 (2832)	-14889 * (6491)
Leadership roles	-6765 (5631)	-22472 *** (4737)
cons	-13768 (13905)	38383 * (16101)
n	1008	1000

Standard errors in parentheses.

* p<0.05, ** p<0.01, *** p<0.001

6 Results of the Professoriate without Leadership Dataset

This section provides results for the Professoriate without Leadership dataset. The analyses presented include data summaries (Section 6.1), a regression model (Section 6.2), and an Oaxaca-Blinder decomposition (Section 6.3).

6.1 Characteristics of the Professoriate without Leadership Dataset

The Professoriate without Leadership dataset had 819 individuals available for analysis. There were 241 women and 578 men (Table 6.1), 165 were coded as visible minority and 7 were coded as Indigenous people. Most had a PhD (86.9%) and the majority were (full) Professors (72.0%). There were fewer women ($p=0.001$) and visible minority and Indigenous people ($p=0.004$) at the Professor rank than at the Assistant Professor or Associate Professor rank. The largest Faculties represented were Arts (129, 15.8%), Engineering (95, 11.6%), Medicine & Dentistry (171, 20.9%), and Science (183, 22.3%). These Faculties differed on the proportion of women ($p<0.001$), with fewer women in Engineering, Medicine & Dentistry, and Science. Engineering was predominately visible minority whilst the other Faculties were predominately white ($p<0.001$).

Table 6.1 summarizes degree, year of hire, rank, and years at rank for the visible minority, Indigenous people, and white groups by gender. There were fewer women than men in each of the visible minority (36/165, 21.8% women) and white (201/647, 31.1% women) groups. For Indigenous people, there were 4 (57.1%) women and 3 men. There were fewer women than men at the Professor rank for the visible minority (44.4% vs 69.8%, $p=0.008$) and white (67.2% vs 77.8%, $p=0.016$) groups. Summaries by Faculty are provided in Table B.3 in Appendix B.1.

Overall, the average compensation was \$173,470 (median=\$159,008) for all individuals in the dataset. When gender was considered, the average compensation was lower for women than for men (\$162,304 women vs \$178,126 men, difference=-\$15,821, $p<0.001$). The median compensation was also lower for women than for men (\$149,220 women vs \$162,016 men, difference=-\$12,796, $p<0.001$). There was no evidence of a statistically significant difference among average compensation for the white, visible minority, and Indigenous people groups ($p=0.259$). The visible minority group had lower median compensation than the Indigenous people and white groups ($p=0.007$); however, this difference disappeared when gender was also considered. Table 6.2 provides the summary statistics for the six groups.

The full distribution of compensation for these groups are shown as histograms in Figure 6.1. The histograms show the number of individuals in each category (i.e., the bar at 125 shows the number of individuals with $\$125,000 \leq \text{compensation} < \$150,000$). All plots have the same y-axis and the histograms show how few individuals there are in some groups. Boxplots allow for better side by side comparison (Figure 6.2). The box shows the 25th (lower quartile) and 75th percentiles (upper quartile),

Table 6.1: Degree and rank by gender by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Variable	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	36	129	4	3	201	446
<i>Degree</i>						
PhD	31 (86.1%)	117 (90.7%)	4 (100.0%)	1 (33.3%)	169 (84.1%)	387 (86.8%)
LLB	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	7 (3.5%)	6 (1.3%)
Other or None	5 (13.9%)	12 (9.3%)	0 (0.0%)	2 (66.7%)	23 (11.4%)	52 (11.7%)
Year of hire, ave (SD)	2002 (6.1)	2000 (7.6)	2004 (4.5)	2005 (6.7)	1999 (7.7)	1998 (9.0)
<i>Rank</i>						
Assistant	4 (11.1%)	4 (3.1%)	0 (0.0%)	1 (33.3%)	8 (4.0%)	12 (2.7%)
Years at rank, ave (SD)	4 (2.2)	5 (4.0)	-	8	5 (2.4)	4 (2.2)
Associate Professor	16 (44.4%)	35 (27.1%)	3 (75.0%)	1 (33.3%)	58 (28.9%)	87 (19.5%)
Years at rank, ave (SD)	6 (3.3)	7 (4.5)	7 (2.5)	2	7 (4.1)	7 (5.6)
Full	16 (44.4%)	90 (69.8%)	1 (25.0%)	1 (33.3%)	135 (67.2%)	347 (77.8%)
Years at rank, ave (SD)	7 (5.0)	9 (6.4)	0	3	8 (6.7)	11 (7.8)

Table 6.2: Summary statistics of compensation by gender by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Summary	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	36	129	4	3	201	446
Minimum	\$126,731	\$125,723	\$127,619	\$126,306	\$125,255	\$125,244
25th percentile	\$134,845	\$139,735	\$128,055	\$126,557	\$134,773	\$144,201
Average	\$167,207	\$170,294	\$133,757	\$174,401	\$161,994	\$180,416
Median	\$146,710	\$158,880	\$130,616	\$126,808	\$151,503	\$163,865
75th percentile	\$162,808	\$186,661	\$136,318	\$198,449	\$175,555	\$200,786
Maximum	\$546,237	\$430,853	\$146,177	\$270,089	\$337,251	\$542,706
Standard Deviation	\$76,088	\$45,480	\$8,628	\$82,868	\$36,114	\$53,810

Table 6.3: Compensation by gender by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Variable	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	36	129	4	3	201	446
Average	\$167,207	\$170,294	\$133,757	\$174,401	\$161,994	\$180,416
Median	\$146,710	\$158,880	\$130,616	\$126,808	\$151,503	\$163,865
<i>Rank</i>						
Assistant Professor	4	4	0	1	8	12
Average	\$145,385	\$205,258	-	\$126,808	\$157,055	\$171,902
Median	\$141,840	\$222,685	-	\$126,808	\$141,467	\$167,112
Associate Professor	16	35	3	1	58	87
Average	\$149,640	\$157,441	\$135,803	\$126,306	\$144,435	\$144,685
Median	\$133,869	\$131,849	\$133,031	\$126,306	\$131,991	\$133,827
Professor	16	90	1	1	135	347
Average	\$190,230	\$173,739	\$127,619	\$270,089	\$169,831	\$189,669
Median	\$157,203	\$161,615	\$127,619	\$270,089	\$160,985	\$173,517

with the median in the middle, and the line extends from the minimum value to the maximum value not including extreme values. The extreme values are individually plotted and exceed 1.5 times the values of the quartiles. As we can see more easily from the boxplot than the histogram, there are some individuals who have large values.

When examined by rank, the average and median compensation for gender by visible minority, Indigenous people, and white groups appear in Table 5.3. The same summaries by Faculty appear in Table B.6 in Appendix B.1.

The next few pages provide additional boxplots of compensation by gender and by visible minority, Indigenous people, and white groups. Boxplots for compensation by rank appear in Figure 6.3. At the Professor rank, there is considerable variability in compensation for most of the groups compared with Assistant and Associate Professors. Figure 6.4 better shows how compensation varies by rank and years at rank, and for (full) Professors. Figure 6.5 shows how years at rank varies by gender, visible minority, and Indigenous people. For the five largest Faculties, the compensation by Faculty and by gender by visible minority, Indigenous people, and white groups appear in Figure 6.6 (Figure B.3 in Appendix B.1 shows the overall distributions of each Faculty).

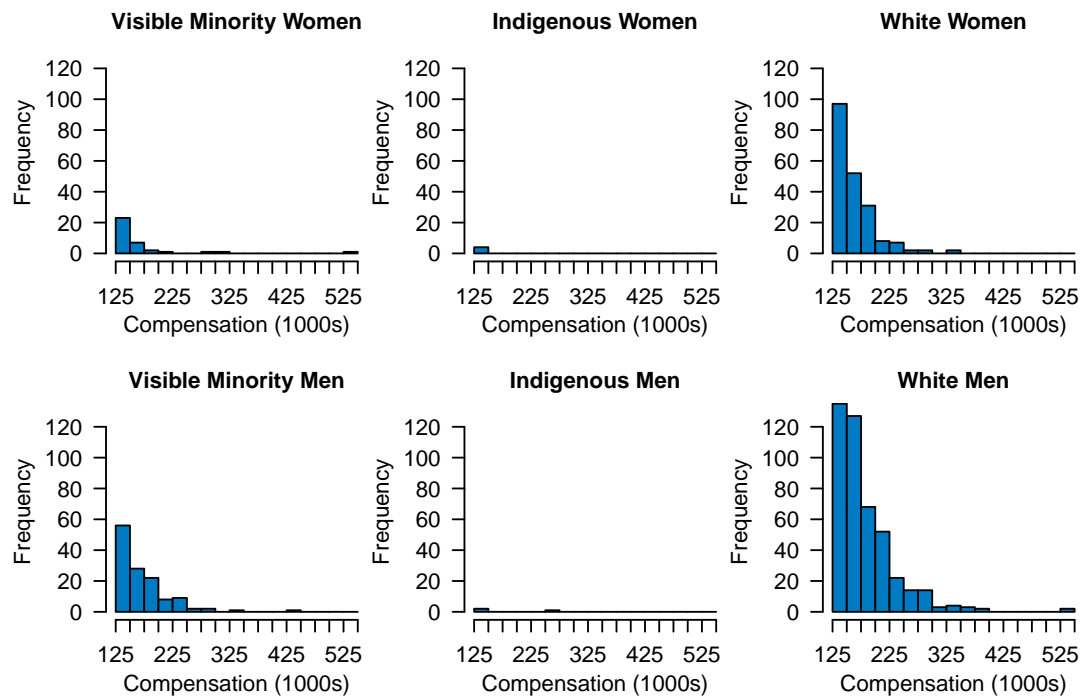
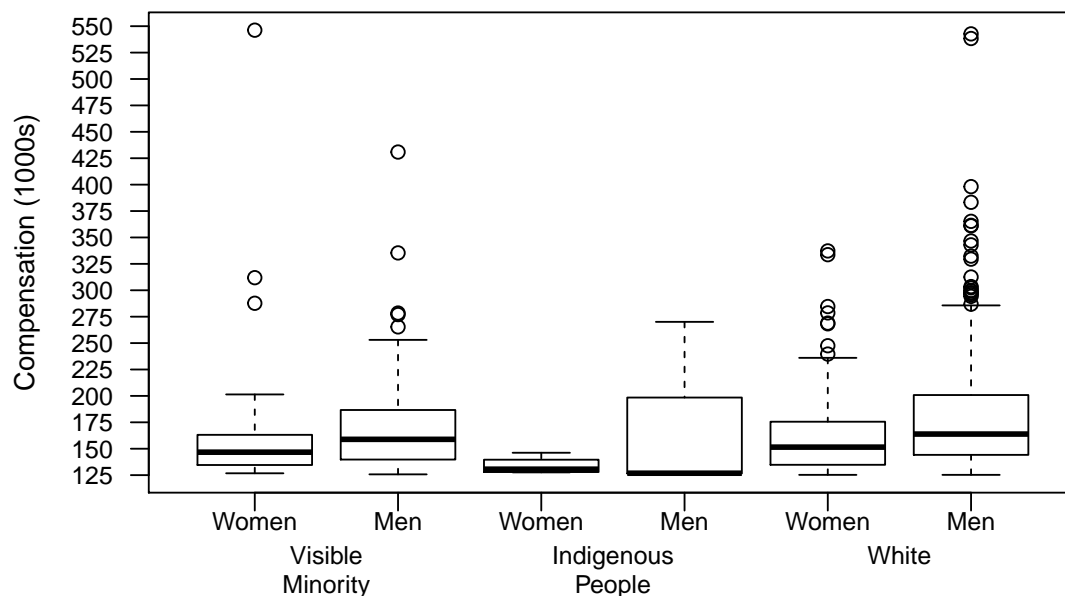
Figure 6.1: Histograms of compensation by groups for the Professoriate without Leadership dataset.**Figure 6.2:** Boxplots of compensation by gender by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Figure 6.3: Boxplots of compensation by rank and by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for the Professoriate without Leadership dataset.

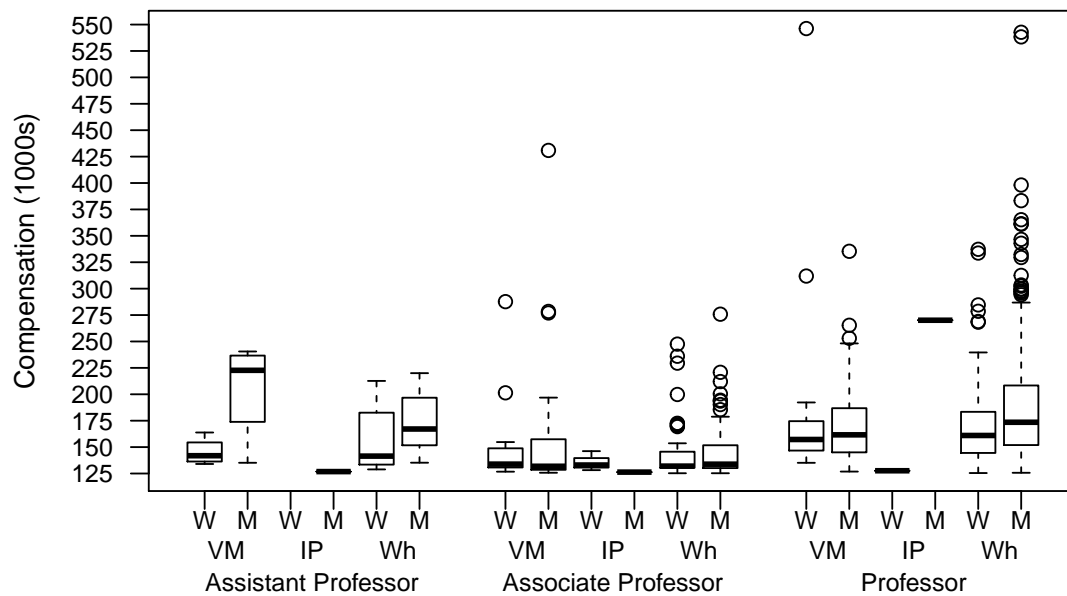


Figure 6.4: Boxplots of compensation by rank and years at rank for the Professoriate without Leadership dataset.

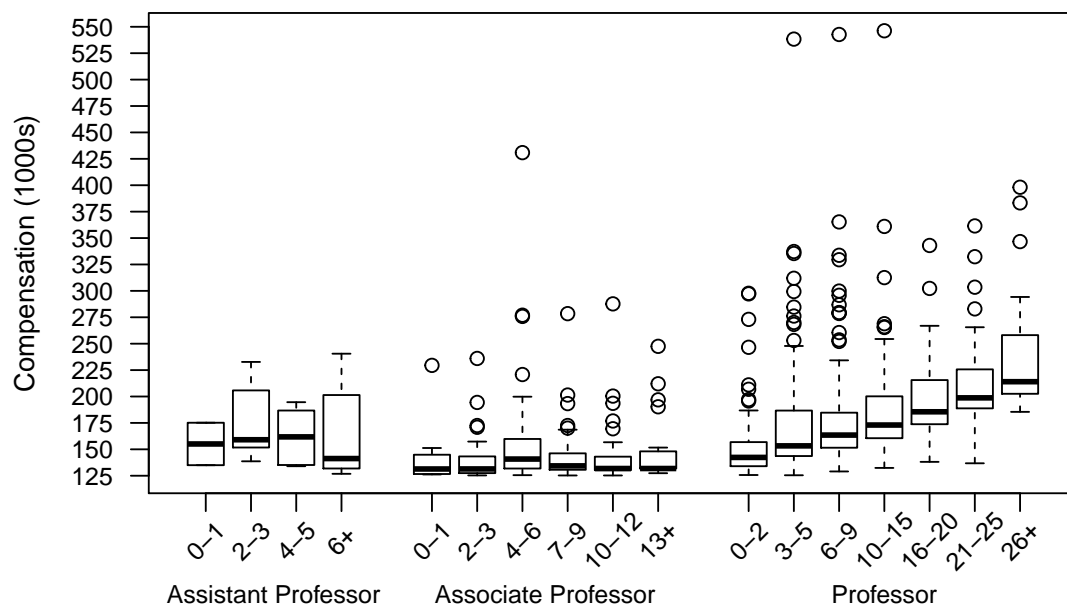


Figure 6.5: Boxplots of compensation by years at rank and by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for (full) Professors in the Professoriate without Leadership dataset.

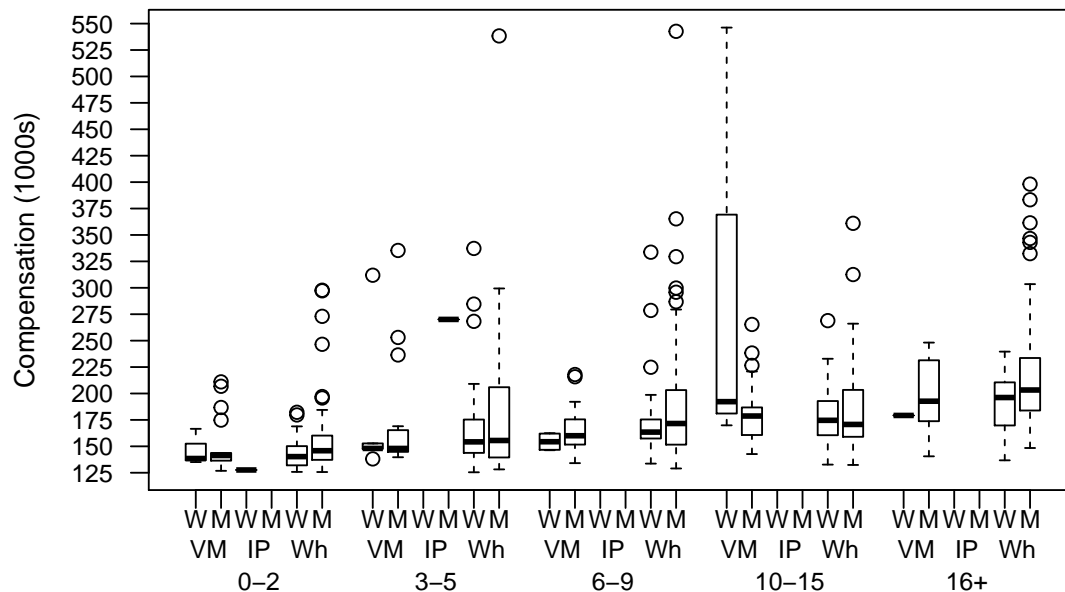
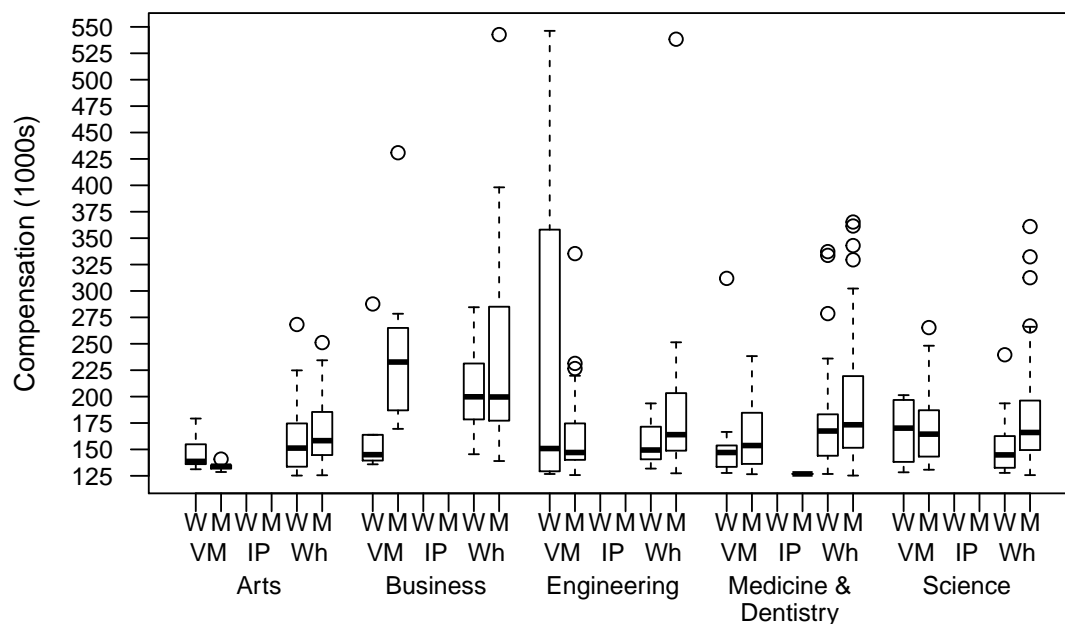


Figure 6.6: Boxplots of compensation for the five largest Faculties by gender (W=women, M=men) by visible minority (VM), Indigenous people (IP), and white (Wh) groups for the Professoriate without Leadership dataset.



6.2 Regression Results for the Professoriate without Leadership Dataset

Several models were fit to examine the relationship between explanatory variables and compensation using the Professoriate without Leadership dataset. The regression coefficient estimates and their associated p-values appear in Table 6.4. The cells highlighted in yellow represent statistically significant terms at the 0.05 level.

Model M1 involves an intercept as well as indicator variables for women, visible minority, and Indigenous people. The estimates provided for the coefficients form a model that can be represented as

$$\text{Compensation} = 179690 - 16085 \times \text{Women} - 6560 \times \text{Visible Minority} - 19323 \times \text{Indigenous} \quad (2)$$

where Women, Visible Minority, and Indigenous are the indicator variables (e.g., Women=1 if an individual is a woman, =0 if a man) as described in Table 3.1. With these variable codings, men who are white are the baseline. Using (2), a white man has an estimated compensation of \$179,690 (i.e., all indicators are 0) and a white woman would have an estimated compensation of $179690 - 16085 = \$163,605$. Similarly, the estimated compensations for visible minority men and women are \$173,130 ($=179690 - 6560$) and \$157,045 ($=179690 - 16085 - 6560$), respectively. For Indigenous people, the estimated compensations for men and women are \$160,367 ($=179690 - 19323$) and \$144,282 ($=179690 - 16085 - 19323$), respectively. The estimated values from the model for the combination of explanatory variables are called the “fitted” values and one approach to assessing a model is to plot the actual values and the fitted values.

The estimated coefficients have an associated p-value that corresponds to a test of whether the coefficient is statistically different from 0. For Women, the p-value < 0.001 is statistically significant at the 0.05 level and there is evidence to conclude it is non-zero. For Visible Minority and Indigenous, the p-values 0.134 and 0.310 suggest that the corresponding coefficients are not statistically different from 0. For this model, there is evidence that compensation varies by gender.

One final note about model M1 is the R-square and adjusted R-square (Adj. R-square) values. The R-square represents the variation captured in the model and the adjusted R-square adjusts the R-square based on the number of variables in the model. Good models will capture more variation than poor models. For model M1, the adjusted R-square is 0.02 which means that only 2% of the variation is explained by the model. This model does not provide a good fit to the data and other variables are required to improve the model fit.

For model M2 with the addition of degree and years since hire, women continue to have a lower compensation than men and years since hire is an important variable adding \$1,272 of compensation for each year an individual has been hired, all other variables held fixed (i.e., someone hired 10 years ago would have additional compensation of \$12,720 than someone hired 0 years ago).

Table 6.4: Compensation regression models for the Professoriate without Leadership dataset.
(Total n=819: n=36 visible minority women, n=129 visible minority men, n=4 Indigenous women, n=3 Indigenous men, n=201 white women, n=446 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	179690	<0.001	154222	<0.001	159299	<0.001	104793	<0.001			76839	<0.001
Women	-16085	<0.001	-13885	<0.001	-7527	<0.001	-1846	0.593			48472	<0.001
Visible Minority	-6560	0.134	-3644	0.399	-785	0.846	-3572	0.348			48536	<0.001
Indigenous	-19323	0.310	-11109	0.552	-1234	0.944	-5864	0.761				
PhD			3822	0.471	5583	0.269	8734	0.068				
LLB			-4443	0.733	-3716	0.760	-31792	0.065				
Years since hire			1272	<0.001	-912	<0.001	-1142	<0.001			-1394	<0.001
Associate Professor					-23317	<0.001	18337	<0.001			45135	<0.001
Professor					8954	0.338	58629	<0.001			94847	<0.001
Years at rank					2906	<0.001	3135	<0.001			3250	<0.001
Agricultural, Life and Environmental Sciences							-6459	0.390				
Arts							-11038	<0.001				
Augustana							-26440	<0.001			-23278	<0.001
Business							77944	<0.001			95295	<0.001
Education							-8016	0.357				
Extension							714	0.971				
Law							36801	<0.001				
Medicine & Dentistry							19450	<0.001			27864	<0.001
Native Studies							61307	0.080				
Nursing							-853	0.934				
Pharmacy and Pharmaceutical Sciences							-4221	0.779				
Physical Education and Recreation							-4805	0.673				
School of Public Health							25951	<0.001			31469	<0.001
Rehabilitation Medicine							-6662	0.565				
Campus Saint-Jean							-17146	0.183				
Science							-2257	0.640				
Interaction Terms:												
Women * Visible Minority											-71284	<0.001
Women * Years since hire											659	0.324
Women * Associate Professor											-42687	<0.001
Women * Professor											-65673	<0.001
Women * Years at rank											-658	0.407
Women * Business											-39793	<0.001
Visible Minority * Years since hire											898	0.230
Visible Minority * Associate Professor											-42244	0.088
Visible Minority * Professor											-59366	<0.001
Visible Minority * Years at rank											-1152	0.197
Visible Minority * Medicine & Dentistry											-21821	<0.001
Women * Visible Minority * Years since hire											-6800	<0.001
Women * Visible Minority * Associate Professor											90882	<0.001
Women * Visible Minority * Professor											147779	<0.001
Women * Visible Minority * Years at rank											8742	<0.001
R-square	0.02		0.07		0.19		0.37		0.43		0.39	
Adj. R-square	0.02		0.06		0.18		0.35		0.36		0.37	

†Estimates not shown because of a large number of terms.

Model M3 adds in rank and years at rank, and explains 18% of the variation. The coefficient for Women is still negative and statistically significant. For each year at rank, an additional \$2,906 is added to the compensation and for each year of hire compensation is reduced by \$912. This result may seem counter-intuitive but years since hire and years at rank are related. Associate Professors have an estimated compensation of -\$23,317 compared to the baseline of Assistant Professor. Because of the \$125,000 threshold, the dataset is more representative of full Professors.

Model M4 includes indicators for each of the Faculties using Engineering as the baseline. Compared to Engineering, the Faculties of Arts and Augustana have coefficients that decrease the compensation whereas the Faculties of Business, Law, Medicine & Dentistry, and the School of Public Health coefficients that increase the compensation. Adding Faculty also markedly increases the adjusted R-square to 35%. With the addition of Faculty, the gender effect is no longer statistically significant although the lower compensated Faculties have higher proportions of women.

Model M5 includes additional interaction terms that allow the coefficients to vary by gender and by visible minority and Indigenous people. This model has too many terms to display and many of the terms are not statistically different from 0. Instead, we removed terms that were not important to the model and display the reduced model, called model M6. This model contains several statistically significant interaction terms. Unlike the other models where you can examine estimates individually, any term involved in an interaction must be considered with the other term in the interaction. Hence, it is best to examine the interactions first.

The Women term is involved in several interactions, including three-way interactions with Visible Minority and Years since hire, Associate Professor, Professor, and Years at rank. For example, consider an individual in a Faculty other than Augustana, Arts, Business, Law, Medicine & Dentistry, or the School of Public Health. The estimated compensation for a visible minority woman who has been hired for 10 years, and is 3 years at the Associate Professor rank is \$117,834 $(= (76839 + 48472 + 48536 - 71284) + (-1394 + 659 - 6800) \times 10 + (45135 - 42687 - 42244 + 90882) + (3250 - 658 - 1152 + 8742) \times 3)$. A white man with all of the same characteristics would have a compensation of \$117,784 $(= 76839 + (-1394) \times 10 + 45135 + (3250) \times 3)$. These formulas can be tedious with all of the indicators but depending on group, coefficients are in or out of the calculation and can be simplified for the gender by visible minority, Indigenous people, and white groups. Table 6.5 shows the simplified version which has all of the calculations for the six different groups. Each group starts with a base value and then additional amounts are added depending on whether or not the individual of interest has the characteristic listed. The white male example from above is $76839 - 1394 \times 10 + 45135 + 3250 \times 3 = \$117,784$. Note that because Indigenous did not appear as a term in the model M6, the estimates for Indigenous men and women would be the same as the estimates for white men and women, respectively.

Using the model's formula and the explanatory variables for the individuals in the dataset, the fitted compensation values can be calculated and these are plotted against the actual compensation. Figure 6.7

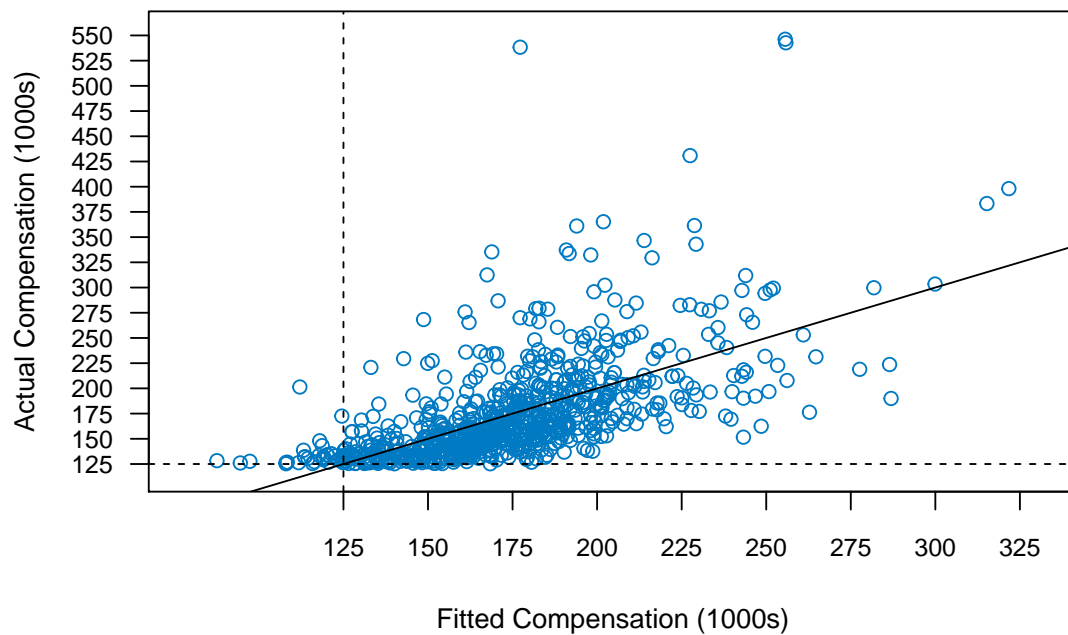
Table 6.5: Summarized regression formula for model M6 by gender by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Characteristic	Visible Minority		Indigenous People or White	
	Women	Men	Women	Men
	\$102,562	\$125,375	\$125,311	\$76,839
+ per Year since hire	−\$6,636	−\$496	−\$734	−\$1,394
+ Associate Professor	\$51,086	\$2,892	\$2,448	\$45,135
+ Professor	\$117,586	\$35,480	\$29,173	\$94,847
+ per Year at rank	\$10,182	\$2,098	\$2,592	\$3,250
+ Business	\$55,502	\$95,295	\$55,502	\$95,295
+ Medicine & Dentistry	\$6,043	\$6,043	\$27,864	\$27,864
+ Augustana	−\$23,278	−\$23,278	−\$23,278	−\$23,278
+ School of Public Health	\$31,469	\$31,469	\$31,469	\$31,469

show the fitted versus actual values for each individual along with the 45° line and dotted lines that show the \$125,000 threshold. Points above 45° line represent individuals who have compensation that is higher than the model would suggest and points below the line have compensation that is lower than the model would suggest. There is quite a bit of variability around the line and as the model only captures 37% of the variation, there are likely unavailable variables that would provide a better model.

There are clearly some large compensation values that may influence the regression model. The results for the alternative modelling approaches described in Section 4.2 appear in Appendix B.2. The results are different for the different models; however, all methods have statistically significant interactions involving gender, visible minority, and Indigenous people. Based on the public data and the models, compensation appears to differ by women and visible minority groups.

Figure 6.7: Fitted versus actual compensation for model M6 in Table 6.4 for the Professoriate without Leadership dataset.



6.3 Oaxaca-Blinder Decomposition for the Professoriate without Leadership Dataset

The OB decompositions of individuals Professoriate without Leadership dataset reported in Table 6.6 lead to inferences similar to those reported in Section 5.3 using the Professoriate with Leadership. Omitting faculty members serving in administrative roles, the estimated men - women gender gap in compensation is \$15,821. Of this gap, \$13,674 can be explained by differences in the average characteristics of men and women. In particular, gender differences in the average number of years in rank and the distribution of faculty members across ranks account for an estimated compensation gap of \$11,799 (\$6,350 + \$5,449) or 75% of the total gap. Gender differences in the distribution across Faculties are no longer a statistically significant contributor to the overall gap - although this is in part due to the reduction in sample size. Likewise, the gender differences in the returns to rank that were significant contributors to the gender gap in the Professoriate with Leadership dataset are no longer statistically significant even though the estimates continue to suggest that gender differences in the returns to rank can account for a large compensation gap (\$10,197).

The white - visible minority gap in the Professoriate without Leadership dataset (\$5,072) remains statistically indistinguishable from zero. Differences in the average number of years in rank and the distribution of professors across ranks account for an estimated compensation gap of \$9,227 (\$4,827 + \$4,390). There are no statistically significant contributions to the compensation gap between whites and visible minorities stemming from differences in the returns to characteristics, but again our estimates indicate that visible minority faculty members may enjoy higher returns to working in particular Faculties than their white peers.

Table 6.6: Oaxaca-Blinder decomposition for the Professoriate without Leadership dataset.

	Men – Women	White – Visible Minority
Differential		
Predicted compensation for reference group	178126 *** (2174)	174693 *** (1954)
Predicted compensation for equity group	162304 *** (2841)	169621 *** (4150)
Total gap	15821 *** (3578)	5072 (4587)
Gap explained by differences in characteristics	13674 *** (2720)	1514 (3064)
Gap explained by differences in returns to characteristics	2148 (3723)	3558 (4137)
Explained by differences in characteristics		
Visible Minority	-263 (323)	
Indigenous	63 (78)	
Women		-158 (360)
Degree type	851 (648)	-982 (552)
Years since hire	-1685 (920)	-2584 * (1209)
Years at rank	6350 *** (1696)	4837 ** (1741)
Rank indicators	5449 *** (1614)	4390 * (1804)
Faculty indicators	2908 (2196)	-3988 (2824)
Explained by differences in the returns to characteristics		
Visible Minority	-1091 (1637)	
Indigenous	173 (119)	
Women		-3924 (4190)
Degree type	13440 (10624)	2050 (8526)
Years since hire	4231 (14344)	4917 (17344)
Years at rank	-831 (6976)	-2582 (8730)

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	Men – Women	White – Visible Minority
Rank indicators	10197 (6813)	6088 (7661)
Faculty indicators	-11516 *** (3296)	-10860 (5853)
cons	-12456 (13519)	7869 (15147)
n	819	812

Standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7 Discussion

We used two sources of publicly available data for compensation and position data on the professoriate to examine compensation in 2015. Internet searches provided additional data on gender, visible minority, and Indigenous people so that the analyses could focus on differences among these groups. We created two datasets, one that included the professoriate who also had a leadership role (considered as Associate Chair, Chair, Associate Dean, Vice Dean, Dean) and one that was a subset of the professoriate who did not have such a leadership role. These data represented about 61% of the professoriate, and were more representative of Professors than Assistant Professors and Associate Professors. Analyses included data summaries, regression modeling, and an economic decomposition.

For the Professoriate with Leadership dataset, there were 1,008 individuals comprised of 300 women, 708 men, 193 visible minority, and 8 Indigenous people. There were fewer women, visible minority, and Indigenous people at the Professor rank, an important observation when compensation will likely be greater for Professors and other ranks have compensation limits. Overall, the median compensation was \$14,782 lower for women than for men (average was \$18,504 lower). There was no evidence of a statistically significant difference among average compensation for visible minority, Indigenous people, and white groups and any difference in median compensation could be attributed to differences in gender. There were relatively few Indigenous people and differences in compensation may be present but there may be insufficient power to detect a statistically significant difference. The same general findings apply to the Professoriate without Leadership dataset as well. There were 819 individuals comprised of 241 women, 578 men, 165 visible minority, and 7 Indigenous people. The average compensation was \$12,796 lower for women than for men for this data subset (average was \$15,821 lower). There was no evidence of a statistically significant difference among average compensation for visible minority, Indigenous people, and white groups and any difference in median compensation could be attributed to differences in gender.

When regression analyses were conducted for both datasets, the gender differences continued even when models adjusted for degree, year since hire, rank, and years at rank. When Faculty was considered, the estimate for gender was not statistically significant and the differences in gender distributions and levels of compensation by some Faculties may have influenced the result. For example in Arts and Medicine & Dentistry, the higher proportion of women occurs in the Faculty with lower compensation. When all of the variables and interactions of the variables with gender, visible minority, and Indigenous people were considered, multiple differences in compensation were identified based on these variables. The presence of statistically significant interactions makes interpretation more difficult as statements about the effect of a variable on compensation has to be considered with the other variables involved in the interaction. Even with the explanatory variables considered, the models captured around 40% of the variation and additional explanatory variables may help to better explain the relationship between compensation and gender, visible minority, and Indigenous people, and determine if the differences are still present.

For the OB decomposition, similar themes emerge with a women - men gender gap. While we infer that much of the gender gap in compensation can be accounted for by differences in observed characteristics between women and men, we find significant evidence of an important gender difference in the promotion process. Both the regression and the OB decomposition analyses raise questions about equity in compensation that warrant further investigation.

The mandate of the Salary Equity Task Force included investigating salary inequities for persons with disabilities. We were unable to examine compensation for these individuals as there were no publicly available records of disabled professors at the University of Alberta.

This study has several limitations.

- The analysis is based on publicly available data that may not be accurate. For example, we noted discrepancies between the Compensation Disclosure List and the Continuing Academic Staff List. We could not address such discrepancies based on retrospective data. We are not able to verify that the data from either source are accurate.
- The data are based on linking the Compensation Disclosure List with the Continuing Academic Staff List and there may errors in linking because of name changes or different representations of names in both lists. In addition, the years of coverage for both lists may not completely overlap.
- Only individuals with a combined compensation and severance in excess of \$125,000 in 2015 and individuals who did not seek exception were included on the Compensation Disclosure List. It is not possible to know if an individual is missing from the List because her/his compensation did not meet the threshold or if s/he was exempted.
- The Compensation Disclosure List may not represent the true salary for some individuals. Individuals who were on sabbatical and other leaves may indeed have compensation in excess of the threshold, but not for the 2015 year. Conversely, individuals on sabbatical or leaves who appear on the Compensation Disclosure List may have a lower value for their compensation because it was based on part of the year. Individuals who started or ended positions during the 2015 calendar year may not have a true representation of their compensation. In particular, there are known former senior administrators on the Continuing Academic Staff List whose position was reported as Professor. These individuals would appear in both the Professoriate with Leadership and Professoriate without Leadership datasets because the position listed was Professor. We elected to keep such individuals in the datasets because we would not know all individuals with the past leadership roles and acknowledge that retention of these faculty members could influence some results.
- Some individuals may have salary awards that contribute to their financial compensation and we were unable to use publicly available data to adjust for such awards. In addition, the contribution from salary awards may not be pensionable or be included with cost of living increases, resulting

in a different level of compensation than someone with the same dollar amount for which all compensation is pensionable.

- We did not consider benefits in our analyses as we did not believe that individual benefits would differ independently of compensation. If differential benefits are provided to the professoriate, an analysis with compensation and benefits may be more appropriate.
- A research assistant in collaboration with AASUA Salary Equity Task Force members provided gender, visible minority, and Indigenous peoples coding for the analyzed dataset and there is the potential for misclassification of membership in these groups.
- The Continuing Academic Staff List contains data on degrees and institution awarding degrees that is not in an easily extractable format. We extracted only PhD, LLB, and MD from the degree list for each person. We note that variants were not considered as all degrees could not easily be extracted. Hence, there may be some individuals with PhD equivalents who are not included as a PhD.
- The Continuing Academic Staff List had irregular formatting of the Department and/or Faculty of a professor. In particular, Psychology is a department in both the Faculties of Arts and Science and it was not clear if a particular professor was part of each Faculty or both.
- There may be other important variables that are not available and thus not included in the analysis that could influence the results.

8 Conclusion

In summary, the analyses of the linked public datasets suggest that there are differences in the compensation of individuals based on gender, visible minority, and Indigenous people. We recognize that these publicly available data have limitations that may influence the results and conclude that there is sufficient evidence to warrant an investigation of compensation at the University of Alberta using Human Resources data that are complete and accurate. Repeating our analyses on Human Resources data would allow quantification of any differences in compensation by gender, visible minority, and Indigenous people and provide evidence for the amounts required for equity.

9 Acknowledgements

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10 Author Details and Contributions

Rhonda J. Rosychuk PhD, P.Stat., PStat®(ASA) is a Professor in the Department of Pediatrics in the Faculty of Medicine & Dentistry. She is a Professional Statistician accredited by the Statistical Society of Canada and the American Statistical Association. She downloaded the Compensation Disclosure List data and the Continuing Academic Staff List, extracted variables, and linked the datasets; performed data cleaning tasks; directed data analyses; created R code; performed some data analyses; interpreted results; wrote R and \LaTeX code to craft the document; drafted an initial version of the document; provided critical revisions of the document; and approved the final version of the document.

Yang Liu is a postdoctoral fellow in the Department of Educational Psychology. He coded the gender, visible minority and Indigenous people groups; performed data cleaning tasks; created R code; performed data analyses; interpreted results; and provided critical revisions of the document.

Andrew McGee PhD, is an Associate Professor in the Department of Economics. He created Stata code, performed the Oaxaca-Blinder decompositions, and contributed text for the document.

Paige Lacy PhD is a Professor in the Division of Pulmonary Medicine, Department of Medicine in the Faculty of Medicine & Dentistry. She is also the Director of the Pulmonary Research Group. She carried out initial analysis on downloaded Compensation Disclosure List data and compared compensation levels with performance indicators (not shown); assisted with data analyses carried out by RJR and YL; and provided critical revisions of the document.

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A Extra Analyses for the Professoriate with Leadership Dataset

A.1 Additional Summaries of the Professoriate with Leadership Dataset

Table A.1: Demographics by gender, visible minority, and Indigenous people for the Professoriate with Leadership dataset.

Variable	Women	Men	Visible Minority	Indigenous People	White	All
n	300	708	193	8	807	1008
<i>Degree</i>						
PhD	258 (86.0%)	621 (87.7%)	174 (90.2%)	6 (75.0%)	699 (86.6%)	879 (87.2%)
LLB	9 (3.0%)	10 (1.4%)	0 (0.0%)	0 (0.0%)	19 (2.4%)	19 (1.9%)
Other or None	35 (11.7%)	78 (11.0%)	19 (9.8%)	2 (25.0%)	92 (11.4%)	113 (11.2%)
Year of hire, ave (SD)	1999 (7.4)	1998 (8.8)	2000 (7.5)	2005 (4.7)	1998 (8.6)	1998 (8.4)
<i>Rank</i>						
Assistant Professor	12 (4.0%)	17 (2.4%)	8 (4.1%)	1 (12.5%)	20 (2.5%)	29 (2.9%)
Years at rank, ave (SD)	5 (2.3)	4 (2.7)	5 (3.1)	8 (-)	4 (2.2)	4 (2.5)
Associate Professor	90 (30.0%)	140 (19.8%)	57 (29.5%)	4 (50.0%)	169 (20.9%)	230 (22.8%)
Years at rank, ave (SD)	7 (4.7)	7 (5.4)	6 (4.3)	6 (3.1)	7 (5.4)	7 (5.1)
Professor	198 (66.0%)	551 (77.8%)	128 (66.3%)	3 (37.5%)	618 (76.6%)	749 (74.3%)
Years at rank, ave (SD)	7 (6.4)	10 (7.6)	8 (6.3)	2 (1.5)	9 (7.6)	9 (7.4)
<i>Leadership Role</i>						
Associate Chair	13 (4.3%)	42 (5.9%)	13 (6.7%)	0 (0.0%)	42 (5.2%)	55 (5.5%)
Chair	21 (7.0%)	39 (5.5%)	9 (4.7%)	1 (12.5%)	50 (6.2%)	60 (6.0%)
Associate Dean	15 (5.0%)	25 (3.5%)	4 (2.1%)	0 (0.0%)	36 (4.5%)	40 (4.0%)
Vice Dean	6 (2.0%)	8 (1.1%)	1 (0.5%)	0 (0.0%)	13 (1.6%)	14 (1.4%)
Dean	4 (1.3%)	15 (2.1%)	1 (0.5%)	0 (0.0%)	18 (2.2%)	19 (1.9%)

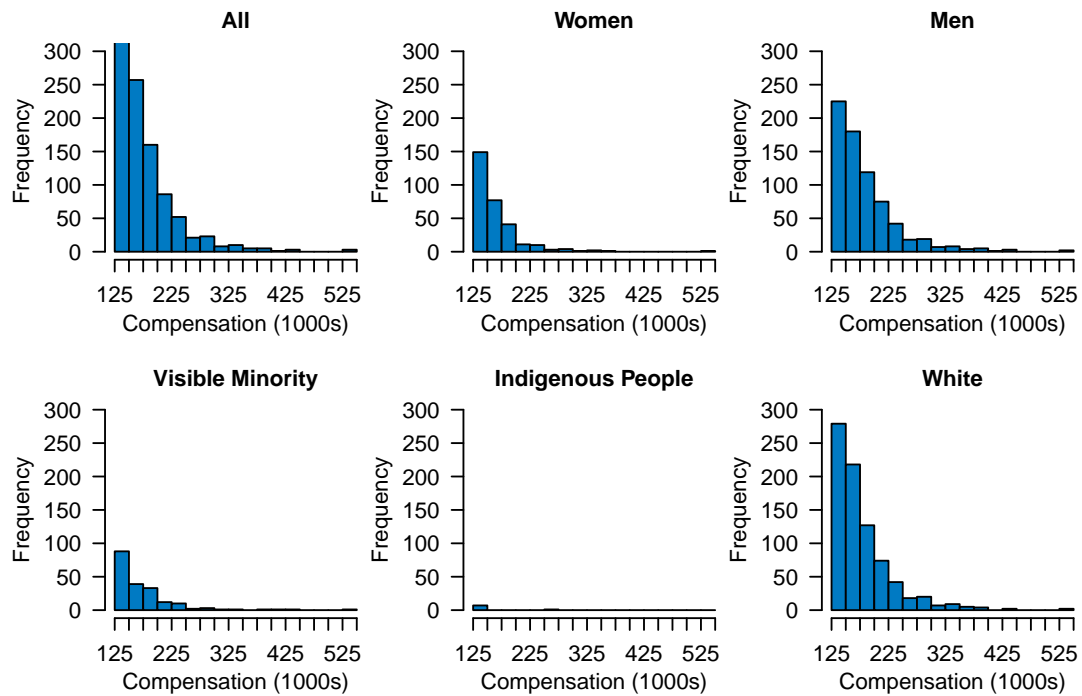
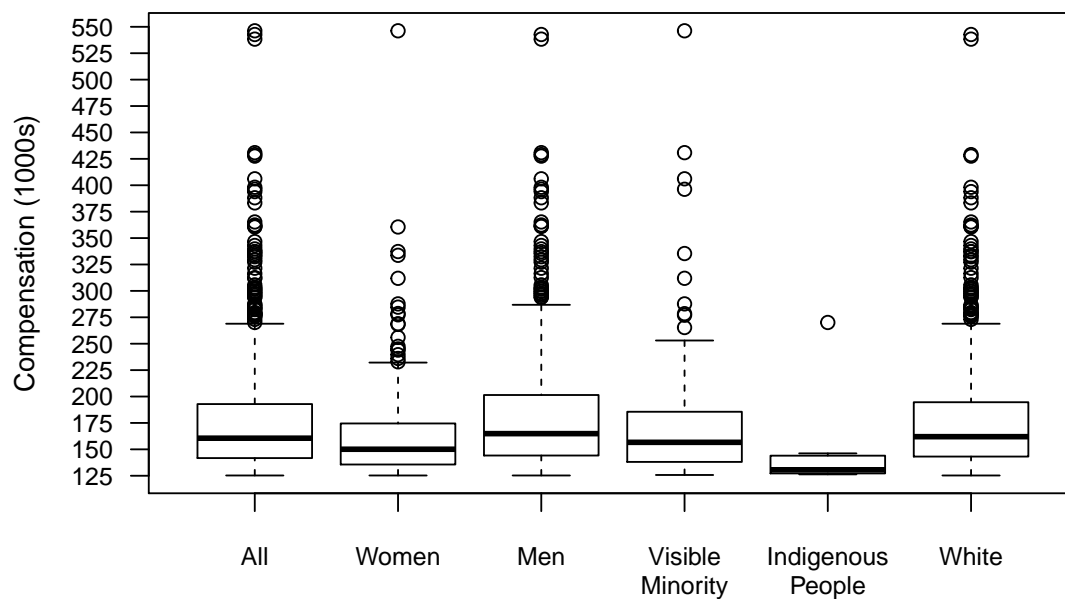
Figure A.1: Histograms of compensation for different groups for the Professoriate with Leadership dataset.**Figure A.2:** Boxplots of compensation for different groups for the Professoriate with Leadership dataset.

Table A.2: Faculty by gender, visible minority, and Indigenous people for the Professoriate with Leadership dataset.

Faculty	Women	Men	Visible Minority	Indigenous People	White	All
n	300	708	193	8	807	1008
Agricultural, Life and Environmental Sciences	20 (6.7%)	37 (5.2%)	7 (3.6%)	0 (0.0%)	50 (6.2%)	57 (5.7%)
Arts	77 (25.7%)	89 (12.6%)	14 (7.3%)	0 (0.0%)	152 (18.8%)	166 (16.5%)
Augustana	6 (2.0%)	20 (2.8%)	1 (0.5%)	0 (0.0%)	25 (3.1%)	26 (2.6%)
Business	14 (4.7%)	49 (6.9%)	18 (9.3%)	0 (0.0%)	45 (5.6%)	63 (6.2%)
Education	29 (9.7%)	18 (2.5%)	3 (1.6%)	4 (50.0%)	40 (5.0%)	47 (4.7%)
Engineering	9 (3.0%)	109 (15.4%)	60 (31.1%)	0 (0.0%)	58 (7.2%)	118 (11.7%)
Extension	4 (1.3%)	3 (0.4%)	1 (0.5%)	1 (12.5%)	5 (0.6%)	7 (0.7%)
Graduate Studies and Research	3 (1.0%)	2 (0.3%)	1 (0.5%)	0 (0.0%)	4 (0.5%)	5 (0.5%)
Law	7 (2.3%)	15 (2.1%)	1 (0.5%)	0 (0.0%)	21 (2.6%)	22 (2.2%)
Medicine & Dentistry	50 (16.7%)	146 (20.6%)	36 (18.7%)	1 (12.5%)	159 (19.7%)	196 (19.4%)
Native Studies	1 (0.3%)	3 (0.4%)	0 (0.0%)	2 (25.0%)	2 (0.2%)	4 (0.4%)
Nursing	23 (7.7%)	3 (0.4%)	0 (0.0%)	0 (0.0%)	26 (3.2%)	26 (2.6%)
Pharmacy and Pharmaceutical Sciences	4 (1.3%)	8 (1.1%)	3 (1.6%)	0 (0.0%)	9 (1.1%)	12 (1.2%)
Physical Education and Recreation	8 (2.7%)	13 (1.8%)	2 (1.0%)	0 (0.0%)	19 (2.4%)	21 (2.1%)
School of Public Health	7 (2.3%)	17 (2.4%)	4 (2.1%)	0 (0.0%)	20 (2.5%)	24 (2.4%)
Rehabilitation Medicine	13 (4.3%)	9 (1.3%)	3 (1.6%)	0 (0.0%)	19 (2.4%)	22 (2.2%)
Campus Saint-Jean	6 (2.0%)	8 (1.1%)	5 (2.6%)	0 (0.0%)	9 (1.1%)	14 (1.4%)
Science	32 (10.7%)	186 (26.3%)	38 (19.7%)	0 (0.0%)	180 (22.3%)	218 (21.6%)

Table A.3: Faculty by gender, by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Faculty	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	43	150	5	3	252	555
Agricultural, Life and Environmental Sciences	1 (2.3%)	6 (4.0%)	0 (0.0%)	0 (0.0%)	18 (7.1%)	30 (5.4%)
Arts	8 (18.6%)	5 (3.3%)	0 (0.0%)	0 (0.0%)	61 (24.2%)	69 (12.4%)
Augustana	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	6 (2.4%)	19 (3.4%)
Business	5 (11.6%)	13 (8.7%)	0 (0.0%)	0 (0.0%)	9 (3.6%)	35 (6.3%)
Education	2 (4.7%)	1 (0.7%)	3 (60.0%)	1 (33.3%)	24 (9.5%)	16 (2.9%)
Engineering	5 (11.6%)	54 (36.0%)	0 (0.0%)	0 (0.0%)	2 (0.8%)	50 (9.0%)
Extension	0 (0.0%)	1 (0.7%)	1 (20.0%)	0 (0.0%)	3 (1.2%)	2 (0.4%)
Graduate Studies and Research	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Law	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	6 (2.4%)	12 (2.2%)
Medicine & Dentistry	10 (23.3%)	25 (16.7%)	0 (0.0%)	1 (33.3%)	37 (14.7%)	114 (20.5%)
Native Studies	0 (0.0%)	0 (0.0%)	1 (20.0%)	1 (33.3%)	0 (0.0%)	2 (0.4%)
Nursing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	23 (9.1%)	2 (0.4%)
Pharmacy and Pharmaceutical Sciences	1 (2.3%)	2 (1.3%)	0 (0.0%)	0 (0.0%)	3 (1.2%)	6 (1.1%)
Physical Education and Recreation	1 (2.3%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	7 (2.8%)	12 (2.2%)
School of Public Health	1 (2.3%)	3 (2.0%)	0 (0.0%)	0 (0.0%)	6 (2.4%)	11 (2.0%)
Rehabilitation Medicine	2 (4.7%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	11 (4.4%)	8 (1.4%)
Campus Saint-Jean	3 (7.0%)	2 (1.3%)	0 (0.0%)	0 (0.0%)	2 (0.8%)	6 (1.1%)
Science	2 (4.7%)	32 (21.3%)	0 (0.0%)	0 (0.0%)	23 (9.1%)	137 (24.7%)

Table A.4: Summary statistics of compensation by gender, visible minority, and Indigenous people for the Professoriate with Leadership dataset.

Summary	Women	Men	Visible Minority	Indigenous People	White	All
n	300	708	193	8	807	1008
Minimum	\$125,255	\$125,244	\$125,723	\$126,306	\$125,244	\$125,244
25th percentile	\$135,660	\$144,161	\$138,103	\$127,417	\$143,169	\$141,756
Average	\$163,340	\$181,843	\$171,810	\$150,009	\$177,679	\$176,336
Median	\$150,079	\$164,861	\$156,639	\$130,616	\$161,989	\$160,558
75th percentile	\$174,477	\$201,409	\$185,579	\$142,927	\$194,586	\$192,856
Maximum	\$546,237	\$542,706	\$546,237	\$270,089	\$542,706	\$546,237
Standard Deviation	\$43,786	\$56,027	\$55,814	\$49,086	\$52,703	\$53,337

Table A.5: Compensation by gender, visible minority, and Indigenous people for the Professoriate with Leadership dataset.

Variable	Women	Men	Visible Minority	Indigenous People	White	All
n	300	708	193	8	807	1008
Average	\$163,340	\$181,843	\$171,810	\$150,009	\$177,679	\$176,336
Median	\$150,079	\$164,861	\$156,639	\$130,616	\$161,989	\$160,558
<i>Rank</i>						
Assistant Professor	12	17	8	1	20	29
Average	\$153,165	\$177,098	\$175,321	\$126,808	\$165,964	\$167,195
Median	\$141,840	\$175,155	\$154,426	\$126,808	\$158,531	\$157,994
Associate Professor	90	140	57	4	169	230
Average	\$144,526	\$147,167	\$153,464	\$133,429	\$143,961	\$146,133
Median	\$134,471	\$133,702	\$131,849	\$130,616	\$134,773	\$133,923
Professor	198	551	128	3	618	749
Average	\$172,508	\$190,800	\$179,760	\$179,851	\$187,279	\$185,965
Median	\$161,431	\$175,444	\$162,477	\$141,843	\$171,375	\$170,656
<i>Leadership Role</i>						
Associate Chair	13	42	13	0	42	55
Average	\$150,216	\$162,322	\$159,244	-	\$159,527	\$159,460
Median	\$148,789	\$159,084	\$157,840	-	\$154,636	\$155,286
Chair	21	39	9	1	50	60
Average	\$163,173	\$215,880	\$223,376	\$141,843	\$193,874	\$197,432
Median	\$160,048	\$203,097	\$184,642	\$141,843	\$176,750	\$180,098
Associate Dean	15	25	4	0	36	40
Average	\$154,869	\$177,445	\$175,055	-	\$168,304	\$168,979
Median	\$147,477	\$169,662	\$181,256	-	\$159,415	\$161,418
Vice Dean	6	8	1	0	13	14
Average	\$174,185	\$224,017	\$187,207	-	\$203,849	\$202,660
Median	\$166,354	\$198,682	\$187,207	-	\$194,216	\$190,712
Dean	4	15	1	0	18	19
Average	\$284,725	\$276,105	\$203,928	-	\$282,030	\$277,920
Median	\$266,672	\$301,592	\$203,928	-	\$289,473	\$277,353

Table A.6: Compensation for Faculties by gender, visible minority, and Indigenous people for the Professoriate with Leadership dataset.

Faculty	Women	Men	Visible Minority	Indigenous People	White	All
n	300	708	193	8	807	1008
Agricultural, Life and Environmental Sciences	20	37	7	0	50	57
Average	\$161,350	\$173,476	\$149,051	-	\$172,045	\$169,221
Median	\$154,337	\$153,552	\$138,115		\$156,909	\$153,552
Arts	77	89	14	0	152	166
Average	\$157,799	\$163,820	\$141,571	-	\$162,819	\$161,027
Median	\$149,611	\$157,114	\$136,621		\$156,923	\$152,680
Augustana	6	20	1	0	25	26
Average	\$139,767	\$153,006	\$134,019	-	\$150,588	\$149,951
Median	\$131,486	\$143,694	\$134,019		\$143,277	\$140,892
Business	14	49	18	0	45	63
Average	\$194,518	\$247,274	\$239,744	-	\$233,873	\$235,550
Median	\$180,311	\$218,397	\$222,685		\$201,378	\$212,028
Education	29	18	3	4	40	47
Average	\$147,766	\$150,366	\$134,522	\$132,200	\$151,485	\$148,761
Median	\$138,106	\$146,782	\$134,027	\$130,325	\$145,315	\$138,627
Engineering	9	109	60	0	58	118
Average	\$194,816	\$174,826	\$166,143	-	\$186,911	\$176,351
Median	\$149,416	\$157,840	\$146,645		\$164,418	\$157,548
Extension	4	3	1	1	5	7
Average	\$174,038	\$151,118	\$193,181	\$128,200	\$165,625	\$164,215
Median	\$161,448	\$133,062	\$193,181	\$128,200	\$133,062	\$133,062
Graduate Studies and Research	3	2	1	0	4	5
Average	\$158,449	\$192,996	\$203,928	-	\$164,353	\$172,268
Median	\$161,181	\$192,996	\$203,928		\$163,935	\$166,689
Law	7	15	1	0	21	22
Average	\$160,477	\$201,531	\$187,207	-	\$188,529	\$188,469
Median	\$161,181	\$187,207	\$187,207		\$169,104	\$172,591
Medicine & Dentistry	50	146	36	1	159	196
Average	\$171,017	\$190,860	\$163,565	\$126,808	\$191,203	\$185,798
Median	\$153,749	\$174,864	\$152,673	\$126,808	\$173,798	\$167,850
Native Studies	1	3	0	2	2	4
Average	\$146,177	\$203,029	-	\$208,133	\$169,499	\$188,816
Median	\$146,177	\$191,374		\$208,133	\$169,499	\$169,499
Nursing	23	3	0	0	26	26
Average	\$169,951	\$155,722	-	-	\$168,309	\$168,309
Median	\$154,235	\$131,827			\$151,644	\$151,644
Pharmacy and Pharmaceutical Sciences	4	8	3	0	9	12

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Variable	Women	Men	Visible Minority	Indigenous People	White	All
Average	\$147,937	\$186,094	\$176,728	-	\$172,257	\$173,375
Median	\$147,268	\$156,750	\$147,598		\$155,365	\$152,078
Physical Education and Recreation	8	13	2	0	19	21
Average	\$169,765	\$169,854	\$162,267	-	\$170,615	\$169,820
Median	\$156,247	\$162,066	\$162,267		\$150,027	\$162,066
School of Public Health	7	17	4	0	20	24
Average	\$175,831	\$192,105	\$175,751	-	\$189,680	\$187,359
Median	\$156,529	\$179,521	\$164,371		\$178,785	\$174,592
Rehabilitation Medicine	13	9	3	0	19	22
Average	\$166,935	\$167,291	\$180,903	-	\$164,898	\$167,080
Median	\$160,217	\$150,439	\$183,251		\$155,319	\$159,872
Campus Saint-Jean	6	8	5	0	9	14
Average	\$138,464	\$165,348	\$148,421	-	\$156,829	\$153,826
Median	\$139,331	\$151,968	\$143,743		\$140,171	\$141,957
Science	32	186	38	0	180	218
Average	\$155,195	\$177,808	\$174,238	-	\$174,542	\$174,489
Median	\$147,051	\$170,305	\$174,560		\$164,018	\$164,736

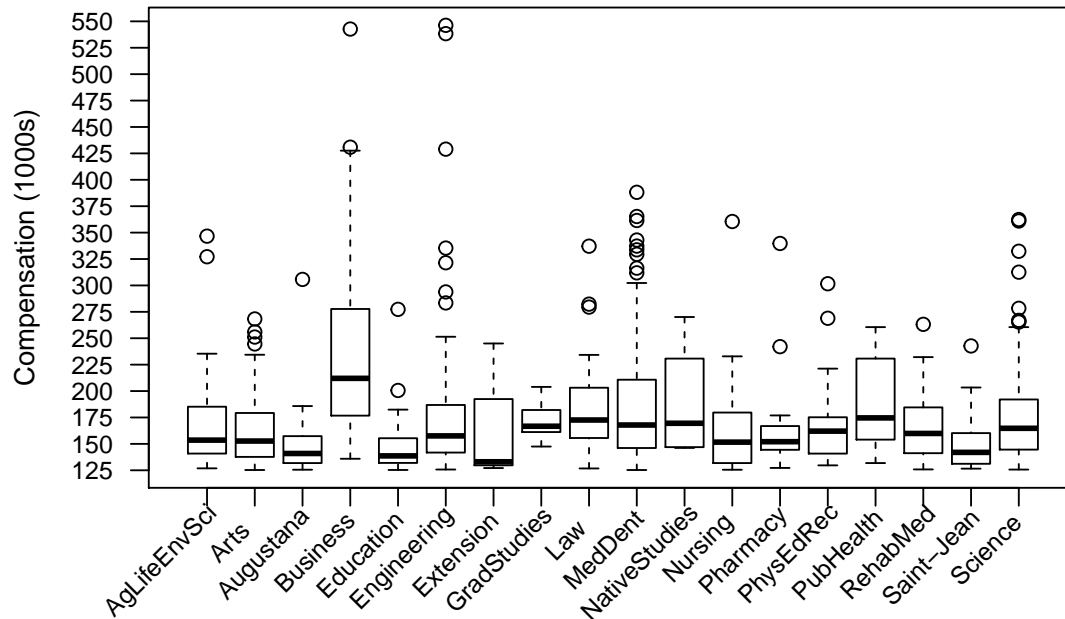
Table A.7: Compensation by Faculty by gender by visible minority, Indigenous people, and white groups for the Professoriate with Leadership dataset.

Faculty	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	43	150	5	3	252	555
Average	\$164,519	\$173,900	\$135,374	\$174,401	\$163,693	\$184,030
Median	\$146,352	\$160,785	\$133,031	\$126,808	\$152,590	\$166,959
Agricultural, Life and Environmental Sciences	1	6	0	0	19	31
Average	\$131,545	\$151,969	-	-	\$162,919	\$177,638
Median	\$131,545	\$142,991	-	-	\$157,101	\$156,716
Arts	9	5	0	0	68	84
Average	\$145,719	\$134,103	-	-	\$159,397	\$165,588
Median	\$138,660	\$134,094	-	-	\$150,683	\$158,296
Augustana	0	1	0	0	6	19
Average	-	\$134,019	-	-	\$139,767	\$154,005
Median	-	\$134,019	-	-	\$131,486	\$144,110
Business	5	13	0	0	9	36
Average	\$174,383	\$264,882	-	-	\$205,705	\$240,915
Median	\$145,020	\$240,521	-	-	\$199,807	\$206,703
Education	2	1	3	1	24	16
Average	\$134,769	\$134,027	\$134,165	\$126,306	\$150,549	\$152,891
Median	\$134,769	\$134,027	\$133,031	\$126,306	\$140,932	\$148,124
Engineering	5	55	0	0	4	54
Average	\$222,364	\$161,032	-	-	\$160,381	\$188,876
Median	\$137,156	\$147,071	-	-	\$158,053	\$164,418
Extension	0	1	1	0	3	2
Average	-	\$193,181	\$128,200	-	\$189,317	\$130,087
Median	-	\$193,181	\$128,200	-	\$191,678	\$130,087
Graduate Studies and Research	0	1	0	0	3	1
Average	-	\$203,928	-	-	\$158,449	\$182,063
Median	-	\$203,928	-	-	\$161,181	\$182,063
Law	0	1	0	0	7	14
Average	-	\$187,207	-	-	\$160,477	\$202,554
Median	-	\$187,207	-	-	\$161,181	\$191,514
Medicine & Dentistry	11	25	0	1	39	120
Average	\$158,375	\$165,849	-	\$126,808	\$174,583	\$196,604
Median	\$147,067	\$154,068	-	\$126,808	\$165,905	\$181,781
Native Studies	0	0	1	1	0	2
Average	-	-	\$146,177	\$270,089	-	\$169,499
Median	-	-	\$146,177	\$270,089	-	\$169,499
Nursing	0	0	0	0	23	3
Average	-	-	-	-	\$169,951	\$155,722
Median	-	-	-	-	\$154,235	\$131,827

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Faculty	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
Pharmacy and Pharmaceutical Sciences	1	2	0	0	3	6
Average	\$147,598	\$191,293	-	-	\$148,049	\$184,361
Median	\$147,598	\$191,293	-	-	\$146,937	\$156,750
Physical Education and Recreation	1	1	0	0	7	12
Average	\$162,467	\$162,066	-	-	\$170,808	\$170,503
Median	\$162,467	\$162,066	-	-	\$150,027	\$152,504
School of Public Health	1	3	0	0	6	14
Average	\$149,220	\$184,594	-	-	\$180,267	\$193,715
Median	\$149,220	\$179,521	-	-	\$172,219	\$190,830
Rehabilitation Medicine	2	1	0	0	11	8
Average	\$183,947	\$174,816	-	-	\$163,842	\$166,350
Median	\$183,947	\$174,816	-	-	\$159,527	\$146,491
Campus Saint-Jean	3	2	0	0	3	6
Average	\$138,363	\$163,508	-	-	\$138,565	\$165,961
Median	\$138,491	\$163,508	-	-	\$140,171	\$146,010
Science	4	34	0	0	28	152
Average	\$167,502	\$175,031	-	-	\$153,437	\$178,429
Median	\$170,144	\$174,560	-	-	\$145,860	\$167,893

Figure A.3: Boxplots of compensation by Faculty for the Professoriate with Leadership dataset.

A.2 Alternative Regression Models for the Professoriate with Leadership Dataset

As compensation data may have extreme values that are overly influential and may be outliers, three alternative approaches were also performed on the Professoriate with Leadership dataset that followed the same modelling strategy as described in Section 4:

1. $\log(\text{Compensation})$ as the response variable y . The model estimates appear in Table A.8 and the fitted versus actual $\log(\text{Compensation})$ plot appears in Figure A.4.
2. Compensation as the response variable and removed large extreme values based on model with only the equity variables. A value was removed based on a standard criterion of requiring both the studentized residual > 3 and Cook's distance $> 4/n$. The model estimates appear in Table A.9 and the fitted versus actual compensation plot appears in Figure A.5.
3. Robust regression models were used for the compensation variable (rlm in R with the psi.huber option). The model estimates appear in Table A.10 and the fitted versus actual compensation plot appears in Figure A.6.

Figure A.4: Fitted versus actual log(compensation) for model M6 in Table A.8 for the Professoriate with Leadership dataset.

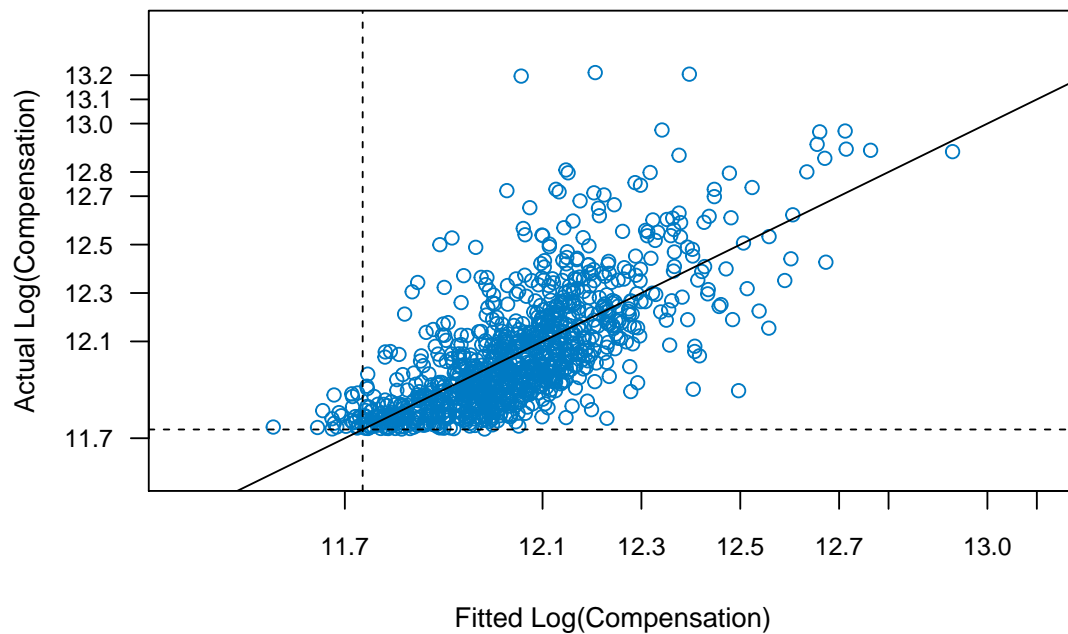


Figure A.5: Fitted versus actual compensation for model M6 in Table A.9 for the Professoriate with Leadership dataset.

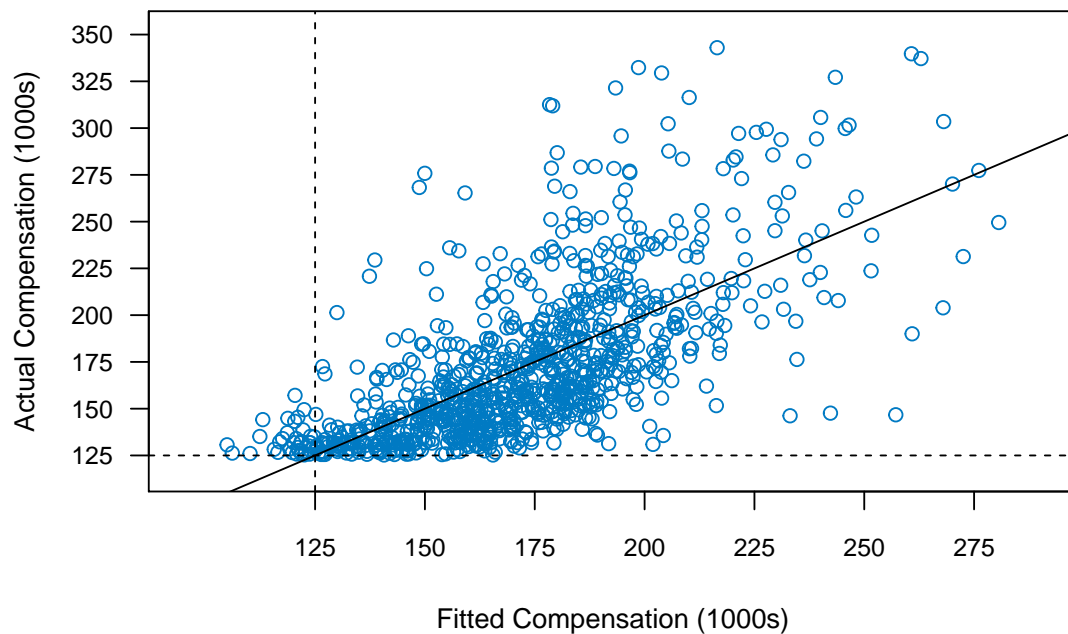


Figure A.6: Fitted versus actual compensation for model M6 in Table A.10 for the Professoriate with Leadership dataset.

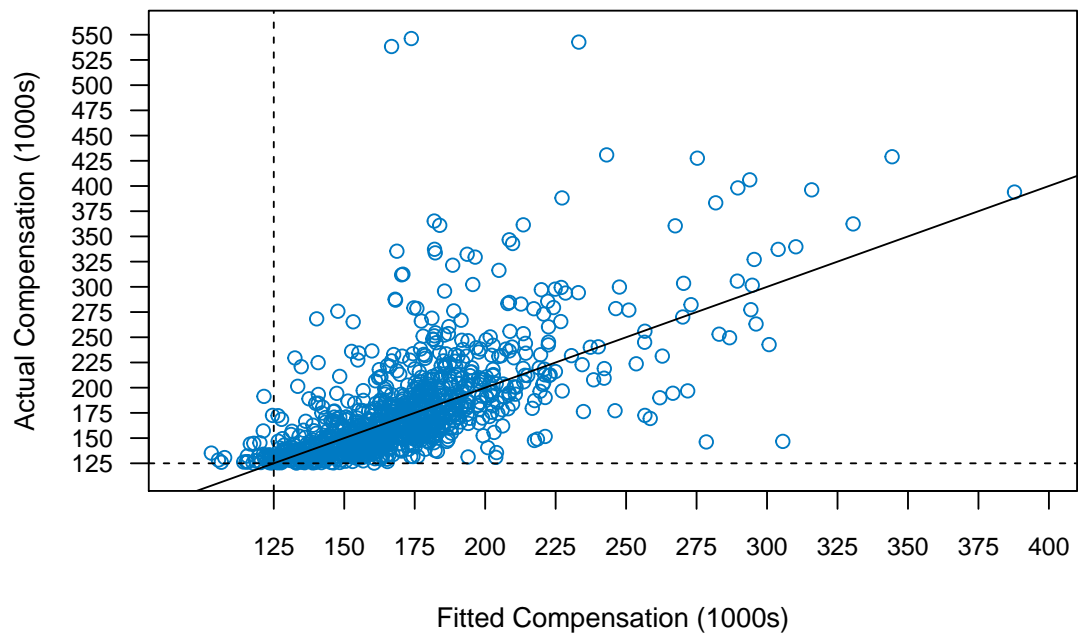


Table A.8: Log(compensation) regression models for the Professoriate with Leadership dataset.

(Total n=1,008: n=43 visible minority women, n=150 visible minority men, n=5 Indigenous women, n=3 Indigenous men, n=252 white women, n=555 white men)

Term	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	12.084	<0.001	11.946	<0.001	11.974	<0.001	11.704	<0.001			11.687	<0.001
Women	-0.097	<0.001	-0.088	<0.001	-0.051	<0.001	-0.015	0.262			0.034	0.322
Visible Minority	-0.045	0.023	-0.031	0.109	-0.004	0.824	-0.021	0.173			-0.045	0.236
Indigenous	-0.139	0.111	-0.091	0.283	-0.049	0.508	0.027	0.700			-0.087	0.629
PhD			0.020	0.400	0.021	0.311	0.029	0.129			0.024	0.173
LLB			0.026	0.653	-0.006	0.901	-0.128	0.062				
Years since hire			0.007	<0.001	-0.004	0.001	-0.005	<0.001			-0.005	<0.001
Associate Professor					-0.156	<0.001	0.064	0.107			0.062	0.121
Professor					0.035	0.400	0.287	<0.001			0.314	<0.001
Years at rank					0.015	<0.001	0.015	<0.001			0.015	<0.001
Associate Chair					-0.001	0.985	0.039	0.135				
Chair					0.116	<0.001	0.128	<0.001			0.113	<0.001
Associate Dean					0.009	0.774	0.036	0.234				
Vice Dean					0.200	<0.001	0.183	<0.001			0.194	<0.001
Dean					0.417	<0.001	0.453	<0.001			0.436	<0.001
Agricultural, Life and Environmental Sciences							-0.052	0.069				
Arts							-0.068	0.001			-0.058	<0.001
Augustana							-0.136	0.001			-0.127	<0.001
Business							0.389	<0.001			0.372	<0.001
Education							-0.077	0.018			-0.064	0.025
Extension							-0.012	0.867				
Graduate Studies and Research							-0.149	0.081				
Law							0.146	0.025				
Medicine & Dentistry							0.098	<0.001			0.104	<0.001
Native Studies							-0.022	0.821				
Nursing							0.014	0.718				
Pharmacy and Pharmaceutical Sciences							-0.002	0.969				
Physical Education and Recreation							-0.015	0.730				
School of Public Health							0.138	<0.001			0.146	<0.001
Rehabilitation Medicine							-0.029	0.500			-0.041	0.332
Campus Saint-Jean							-0.086	0.087				
Science							-0.003	0.867				
Interaction Terms:												
Women * Visible Minority											0.079	0.362
Women * Years since hire											0.001	0.652
Women * Professor											-0.082	0.006
Women * Years at rank											-0.002	0.527
Women * Business											-0.051	0.456
Visible Minority * Years since hire											0.001	0.698
Visible Minority * Years at rank											-0.002	0.557
Visible Minority * Business											0.222	<0.001
Visible Minority * Rehabilitation Medicine											0.299	0.017
Indigenous * PhD											-0.612	0.005
Indigenous * Associate Professor											0.701	0.019
Indigenous * Professor											0.561	0.027
Women * Visible Minority * Years since hire											-0.013	0.043
Women * Visible Minority * Years at rank											0.024	0.006
Women * Visible Minority * Business											-0.366	0.003
R-square	0.04		0.09		0.33		0.50		0.55		0.52	
Adj. R-square	0.04		0.09		0.32		0.49		0.50		0.50	

†Estimates not shown because of a large number of terms.

Table A.9: Compensation regression models for the Professoriate with Leadership dataset with outliers removed.
(Total n=987: n=42 visible minority women, n=146 visible minority men, n=5 Indigenous women, n=3 Indigenous men, n=249 white women, n=542 white men)

Term	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	178499	<0.001	157356	<0.001	162831	<0.001	115840	<0.001			111917	<0.001
Women	-16606	<0.001	-15391	<0.001	-9505	<0.001	-4081	0.087			2802	0.490
Visible Minority	-9658	<0.001	-7534	<0.001	-3513	0.220	-4939	0.064			-5292	<0.001
Indigenous	-18111	0.210	-10648	0.451	-4180	0.737	8488	0.488			-15083	0.632
PhD			2671	0.499	3310	0.349	6022	0.067			8286	<0.001
LLB			7547	0.434	1742	0.838	-25717	<0.001				
Years since hire			1078	<0.001	-585	<0.001	-732	<0.001			-671	<0.001
Associate Professor					-26209	<0.001	7290	0.292			6323	0.365
Professor					3422	0.626	42438	<0.001			46508	<0.001
Years at rank					2381	<0.001	2583	<0.001			2478	<0.001
Associate Chair					-239	0.962	6536	0.144				
Chair					17209	<0.001	21247	<0.001			19972	<0.001
Associate Dean					2579	0.645	7152	0.178				
Vice Dean					25620	<0.001	25987	<0.001			27452	<0.001
Dean					77574	<0.001	88952	<0.001			83186	<0.001
Agricultural, Life and Environmental Sciences							-5993	0.233				
Arts							-8406	<0.001			-11516	<0.001
Augustana							-18367	<0.001			-17049	<0.001
Business							63972	<0.001			64507	<0.001
Education							-9644	0.087				
Extension							2067	0.868				
Graduate Studies and Research							-30712	<0.001				
Law							35981	<0.001			19484	<0.001
Medicine & Dentistry							20540	<0.001			20892	<0.001
Native Studies							-1549	0.928				
Nursing							4723	0.503				
Pharmacy and Pharmaceutical Sciences							6581	0.489				
Physical Education and Recreation							2567	0.730				
School of Public Health							28696	<0.001			28497	<0.001
Rehabilitation Medicine							-439	0.953				
Campus Saint-Jean							-10464	0.230				
Science							2611	0.432				
Interaction Terms:												
Women * Professor											-15072	<0.001
Women * Arts											10648	<0.001
Indigenous * PhD											-132040	<0.001
Indigenous * Associate Professor											145512	<0.001
Indigenous * Professor											121327	<0.001
R-square	0.04		0.09		0.30		0.46		0.51		0.46	
Adj. R-square	0.04		0.08		0.29		0.44		0.45		0.45	

†Estimates not shown because of a large number of terms.

Table A.10: Compensation regression models for the Professoriate with Leadership dataset using robust regression.

(Total n=1,008: n=43 visible minority women, n=150 visible minority men, n=5 Indigenous women, n=3 Indigenous men, n=252 white women, n=555 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	173851	<0.001	146175	<0.001	157307	<0.001	113570	<0.001			97758	<0.001
Women	-14433	<0.001	-12456	<0.001	-7070	<0.001	-3105	0.107			27704	<0.001
Visible Minority	-7537	<0.001	-5011	0.060	-1883	0.395	-3142	0.148			-1905	0.465
Indigenous	-23568	0.063	-16473	0.165	-10422	0.286	-842	0.932			2115	0.932
PhD			3734	0.251	3459	0.204	5906	<0.001			5284	<0.001
LLB			3396	0.670	2224	0.733	-19440	0.055			-48536	<0.001
Years since hire			1351	<0.001	-722	<0.001	-887	<0.001			-815	<0.001
Associate Professor					-26195	<0.001	7866	0.165			20321	<0.001
Professor					2420	0.660	41643	<0.001			58050	<0.001
Years at rank					2655	<0.001	2830	<0.001			2713	<0.001
Associate Chair					5097	0.178	10036	<0.001			9614	<0.001
Chair					21369	<0.001	24975	<0.001			24457	<0.001
Associate Dean					4310	0.316	7020	0.101				
Vice Dean					33527	<0.001	31682	<0.001			29842	<0.001
Dean					111460	<0.001	117048	<0.001			137737	<0.001
Agricultural, Life and Environmental Sciences							-4535	0.268				
Arts							-8103	<0.001			-7786	<0.001
Augustana							-18051	<0.001			-16964	<0.001
Business							66390	<0.001			71344	<0.001
Education							-6747	0.136				
Extension							185	0.985				
Graduate Studies and Research							-25308	<0.001				
Law							28035	<0.001			57042	<0.001
Medicine & Dentistry							16005	<0.001			18271	<0.001
Native Studies							2794	0.864			-71838	<0.001
Nursing							7410	0.194				
Pharmacy and Pharmaceutical Sciences							8004	0.302				
Physical Education and Recreation							-94	0.988				
School of Public Health							28977	<0.001			29047	<0.001
Rehabilitation Medicine							218	0.970				
Campus Saint-Jean							-10101	0.143				
Science							1514	0.574				
Interaction Terms:												
Women * Visible Minority											1639	0.741
Women * LLB											50286	<0.001
Women * Associate Professor											-22438	<0.001
Women * Professor											-33718	<0.001
Women * Dean											-37856	<0.001
Women * Business											-18882	0.074
Women * Law											-54598	<0.001
Women * Native Studies											85187	<0.001
Visible Minority * Dean											-116297	<0.001
Visible Minority * Business											46774	<0.001
Visible Minority * Medicine & Dentistry											-12210	<0.001
Indigenous * PhD											-207969	<0.001
Indigenous * Associate Professor											202473	<0.001
Indigenous * Professor											178310	<0.001
Women * Visible Minority * Business											-76615	<0.001

†Estimates not shown because of a large number of terms.

B Extra Analyses for the Professoriate without Leadership Dataset

B.1 Additional Summaries of the Professoriate without Leadership Dataset

Table B.1: Demographics by gender, visible minority, and Indigenous people for the Professoriate without Leadership dataset.

Variable	Women	Men	Visible Minority	Indigenous People	White	All
n	241	578	165	7	647	819
<i>Degree</i>						
PhD	206 (85.5%)	506 (87.5%)	148 (89.7%)	5 (71.4%)	559 (86.4%)	712 (86.9%)
LLB	9 (3.7%)	7 (1.2%)	0 (0.0%)	0 (0.0%)	16 (2.5%)	16 (2.0%)
Other or None	28 (11.6%)	66 (11.4%)	17 (10.3%)	2 (28.6%)	75 (11.6%)	94 (11.5%)
Year of hire, ave (SD)	2000 (7.5)	1998 (8.8)	2000 (7.3)	2005 (5.0)	1998 (8.7)	1999 (8.4)
<i>Rank</i>						
Assistant Professor	12 (5.0%)	17 (2.9%)	8 (4.8%)	1 (14.3%)	20 (3.1%)	29 (3.5%)
Years at rank, ave (SD)	5 (2.3)	4 (2.7)	5 (3.1)	8 (-)	4 (2.2)	4 (2.5)
Associate Professor	77 (32.0%)	123 (21.3%)	51 (30.9%)	4 (57.1%)	145 (22.4%)	200 (24.4%)
Years at rank, ave (SD)	7 (3.9)	7 (5.3)	7 (4.1)	6 (3.1)	7 (5.1)	7 (4.8)
Professor	152 (63.1%)	438 (75.8%)	106 (64.2%)	2 (28.6%)	482 (74.5%)	590 (72.0%)
Years at rank, ave (SD)	8 (6.5)	10 (7.6)	8 (6.2)	2 (2.1)	10 (7.6)	10 (7.4)

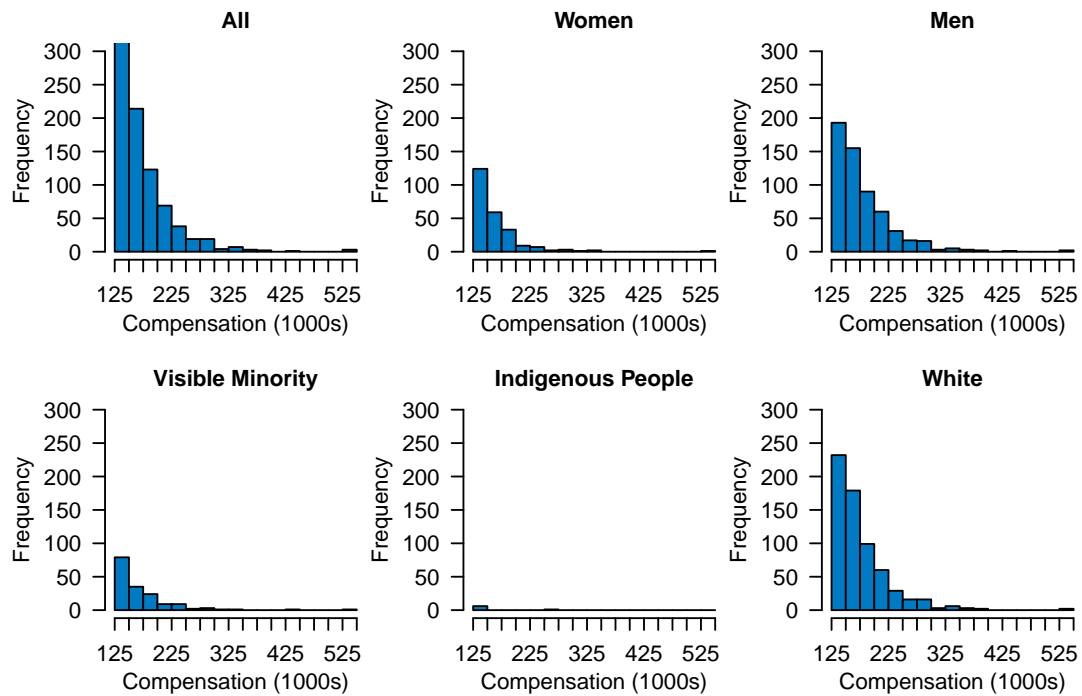
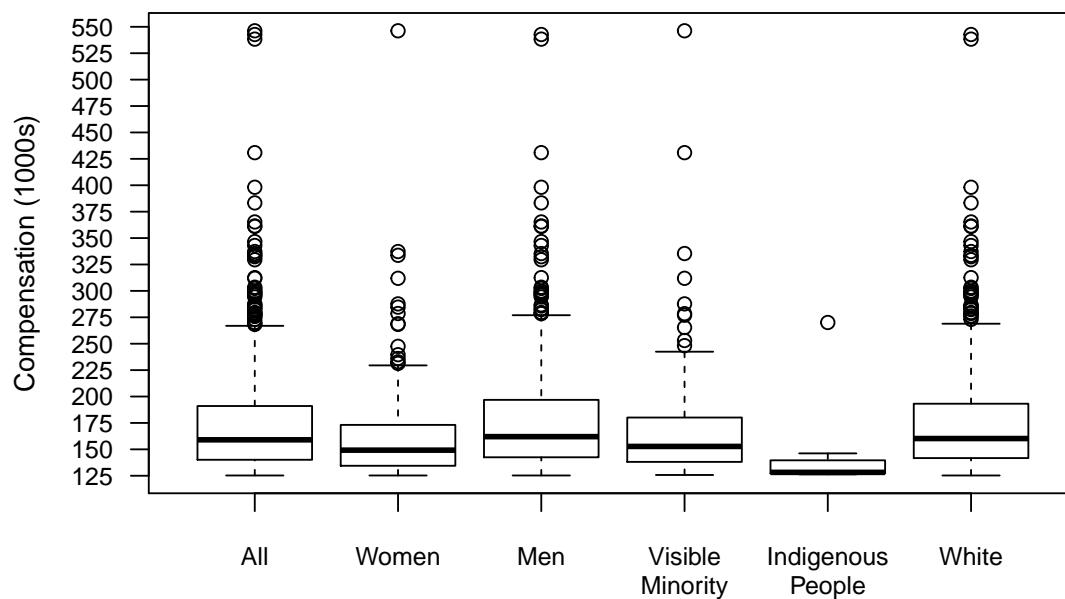
Figure B.1: Histograms of compensation for different groups for the Professoriate without Leadership dataset.**Figure B.2:** Boxplots of compensation for different groups for the Professoriate without Leadership dataset.

Table B.2: Faculty by gender, visible minority, and Indigenous people for the Professoriate without Leadership dataset.

Faculty	Women	Men	Visible Minority	Indigenous People	White	All
n	241	578	165	7	647	819
Agricultural, Life and Environmental Sciences	16 (6.6%)	27 (4.7%)	5 (3.0%)	0 (0.0%)	38 (5.9%)	43 (5.3%)
Arts	58 (24.1%)	71 (12.3%)	12 (7.3%)	0 (0.0%)	117 (18.1%)	129 (15.8%)
Augustana	4 (1.7%)	17 (2.9%)	1 (0.6%)	0 (0.0%)	20 (3.1%)	21 (2.6%)
Business	14 (5.8%)	43 (7.4%)	16 (9.7%)	0 (0.0%)	41 (6.3%)	57 (7.0%)
Education	21 (8.7%)	12 (2.1%)	2 (1.2%)	3 (42.9%)	28 (4.3%)	33 (4.0%)
Engineering	7 (2.9%)	88 (15.2%)	51 (30.9%)	0 (0.0%)	44 (6.8%)	95 (11.6%)
Extension	3 (1.2%)	2 (0.3%)	0 (0.0%)	1 (14.3%)	4 (0.6%)	5 (0.6%)
Graduate Studies and Research	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Law	6 (2.5%)	11 (1.9%)	0 (0.0%)	0 (0.0%)	17 (2.6%)	17 (2.1%)
Medicine & Dentistry	47 (19.5%)	124 (21.5%)	35 (21.2%)	1 (14.3%)	135 (20.9%)	171 (20.9%)
Native Studies	1 (0.4%)	1 (0.2%)	0 (0.0%)	2 (28.6%)	0 (0.0%)	2 (0.2%)
Nursing	18 (7.5%)	2 (0.3%)	0 (0.0%)	0 (0.0%)	20 (3.1%)	20 (2.4%)
Pharmacy and Pharmaceutical Sciences	3 (1.2%)	5 (0.9%)	3 (1.8%)	0 (0.0%)	5 (0.8%)	8 (1.0%)
Physical Education and Recreation	6 (2.5%)	9 (1.6%)	2 (1.2%)	0 (0.0%)	13 (2.0%)	15 (1.8%)
School of Public Health	6 (2.5%)	16 (2.8%)	4 (2.4%)	0 (0.0%)	18 (2.8%)	22 (2.7%)
Rehabilitation Medicine	8 (3.3%)	7 (1.2%)	1 (0.6%)	0 (0.0%)	14 (2.2%)	15 (1.8%)
Campus Saint-Jean	5 (2.1%)	6 (1.0%)	4 (2.4%)	0 (0.0%)	7 (1.1%)	11 (1.3%)
Science	28 (11.6%)	155 (26.8%)	32 (19.4%)	0 (0.0%)	151 (23.3%)	183 (22.3%)

Table B.3: Faculty by gender, by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Faculty	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	36	129	4	3	201	446
Agricultural, Life and Environmental Sciences	0 (0.0%)	5 (3.9%)	0 (0.0%)	0 (0.0%)	15 (7.5%)	22 (4.9%)
Arts	6 (16.7%)	5 (3.9%)	0 (0.0%)	0 (0.0%)	44 (21.9%)	54 (12.1%)
Augustana	0 (0.0%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	4 (2.0%)	16 (3.6%)
Business	5 (13.9%)	11 (8.5%)	0 (0.0%)	0 (0.0%)	9 (4.5%)	31 (7.0%)
Education	1 (2.8%)	1 (0.8%)	2 (50.0%)	1 (33.3%)	18 (9.0%)	10 (2.2%)
Engineering	4 (11.1%)	46 (35.7%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	39 (8.7%)
Extension	0 (0.0%)	0 (0.0%)	1 (25.0%)	0 (0.0%)	2 (1.0%)	2 (0.4%)
Graduate Studies and Research	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Law	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (3.0%)	9 (2.0%)
Medicine & Dentistry	10 (27.8%)	24 (18.6%)	0 (0.0%)	1 (33.3%)	35 (17.4%)	97 (21.7%)
Native Studies	0 (0.0%)	0 (0.0%)	1 (25.0%)	1 (33.3%)	0 (0.0%)	0 (0.0%)
Nursing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	18 (9.0%)	1 (0.2%)
Pharmacy and Pharmaceutical Sciences	1 (2.8%)	2 (1.6%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	3 (0.7%)
Physical Education and Recreation	1 (2.8%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	5 (2.5%)	8 (1.8%)
School of Public Health	1 (2.8%)	3 (2.3%)	0 (0.0%)	0 (0.0%)	5 (2.5%)	10 (2.2%)
Rehabilitation Medicine	0 (0.0%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	8 (4.0%)	6 (1.3%)
Campus Saint-Jean	3 (8.3%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	5 (1.1%)
Science	2 (5.6%)	27 (20.9%)	0 (0.0%)	0 (0.0%)	19 (9.5%)	117 (26.2%)

Table B.4: Summary statistics of compensation by gender, visible minority, and Indigenous people for the Professoriate without Leadership dataset.

Summary	Women	Men	Visible Minority	Indigenous People	White	All
n	241	578	165	7	647	819
Minimum	\$125,255	\$125,244	\$125,723	\$126,306	\$125,244	\$125,244
25th percentile	\$134,436	\$142,521	\$138,115	\$127,214	\$141,733	\$140,110
Average	\$162,304	\$178,126	\$169,621	\$151,176	\$174,693	\$173,470
Median	\$149,220	\$162,016	\$152,745	\$128,200	\$160,217	\$159,008
75th percentile	\$173,143	\$196,812	\$180,117	\$139,604	\$193,183	\$191,014
Maximum	\$546,237	\$542,706	\$546,237	\$270,089	\$542,706	\$546,237
Standard Deviation	\$44,151	\$52,284	\$53,400	\$52,899	\$49,710	\$50,519

Table B.5: Compensation by gender, visible minority, and Indigenous people for the Professoriate without Leadership dataset.

Variable	Women	Men	Visible Minority	Indigenous People	White	All
n	241	578	165	7	647	819
Average	\$162,304	\$178,126	\$169,621	\$151,176	\$174,693	\$173,470
Median	\$149,220	\$162,016	\$152,745	\$128,200	\$160,217	\$159,008
<i>Rank</i>						
Assistant Professor	12	17	8	1	20	29
Average	\$153,165	\$177,098	\$175,321	\$126,808	\$165,964	\$167,195
Median	\$141,840	\$175,155	\$154,426	\$126,808	\$158,531	\$157,994
Associate Professor	77	123	51	4	145	200
Average	\$145,180	\$148,166	\$154,994	\$133,429	\$144,585	\$147,016
Median	\$132,106	\$133,491	\$131,849	\$130,616	\$133,577	\$133,181
Professor	152	438	106	2	482	590
Average	\$171,701	\$186,579	\$176,228	\$198,854	\$184,113	\$182,746
Median	\$160,760	\$171,942	\$161,615	\$198,854	\$169,918	\$168,046

Table B.6: Compensation by Faculty by gender by visible minority, Indigenous people, and white groups for the Professoriate without Leadership dataset.

Faculty	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
n	36	129	4	3	201	446
Average	\$167,207	\$170,294	\$133,757	\$174,401	\$161,994	\$180,416
Median	\$146,710	\$158,880	\$130,616	\$126,808	\$151,503	\$163,865
Agricultural, Life and Environmental Sciences	0	5	0	0	16	22
Average	-	\$156,098	-	-	\$161,725	\$174,047
Median	-	\$147,866	-	-	\$154,337	\$155,134
Arts	7	5	0	0	51	66
Average	\$147,273	\$134,103	-	-	\$159,364	\$165,780
Median	\$138,660	\$134,094	-	-	\$151,234	\$158,296
Augustana	0	1	0	0	4	16
Average	-	\$134,019	-	-	\$132,520	\$142,061
Median	-	\$134,019	-	-	\$129,851	\$140,892
Business	5	11	0	0	9	32
Average	\$174,383	\$240,106	-	-	\$205,705	\$230,054
Median	\$145,020	\$232,724	-	-	\$199,807	\$199,628
Education	1	1	2	1	18	10
Average	\$131,827	\$134,027	\$130,325	\$126,306	\$142,793	\$156,670
Median	\$131,827	\$134,027	\$130,325	\$126,306	\$137,657	\$153,953
Engineering	4	47	0	0	3	41
Average	\$243,666	\$161,370	-	-	\$158,278	\$181,710
Median	\$150,847	\$147,071	-	-	\$149,416	\$163,954
Extension	0	0	1	0	2	2
Average	-	-	\$128,200	-	\$161,448	\$130,087
Median	-	-	\$128,200	-	\$161,448	\$130,087
Graduate Studies and Research	0	0	0	0	0	0
Average	-	-	-	-	-	-
Median	-	-	-	-	-	-
Law	0	0	0	0	6	11
Average	-	-	-	-	\$160,360	\$194,346
Median	-	-	-	-	\$164,702	\$183,830
Medicine & Dentistry	11	24	0	1	36	99
Average	\$158,375	\$163,672	-	\$126,808	\$176,343	\$192,637
Median	\$147,067	\$153,669	-	\$126,808	\$167,401	\$173,310
Native Studies	0	0	1	1	0	0
Average	-	-	\$146,177	\$270,089	-	-
Median	-	-	\$146,177	\$270,089	-	-
Nursing	0	0	0	0	18	2
Average	-	-	-	-	\$162,016	\$128,684
Median	-	-	-	-	\$155,552	\$128,684

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Faculty	Visible Minority		Indigenous People		White	
	Women	Men	Women	Men	Women	Men
Pharmacy and Pharmaceutical Sciences	1	2	0	0	2	3
Average	\$147,598	\$191,293	-	-	\$144,391	\$144,283
Median	\$147,598	\$191,293	-	-	\$144,391	\$148,790
Physical Education and Recreation	1	1	0	0	5	8
Average	\$162,467	\$162,066	-	-	\$167,511	\$153,125
Median	\$162,467	\$162,066	-	-	\$144,070	\$141,315
School of Public Health	1	3	0	0	5	13
Average	\$149,220	\$184,594	-	-	\$167,531	\$195,565
Median	\$149,220	\$179,521	-	-	\$156,529	\$211,998
Rehabilitation Medicine	0	1	0	0	8	6
Average	-	\$174,816	-	-	\$155,065	\$154,181
Median	-	\$174,816	-	-	\$153,218	\$141,364
Campus Saint-Jean	3	1	0	0	2	5
Average	\$138,363	\$143,743	-	-	\$137,762	\$150,612
Median	\$138,491	\$143,743	-	-	\$137,762	\$131,827
Science	4	28	0	0	24	127
Average	\$167,502	\$172,205	-	-	\$152,599	\$177,433
Median	\$170,144	\$164,450	-	-	\$144,816	\$166,050

Figure B.3: Boxplots of compensation by Faculty for the Professoriate without Leadership dataset.

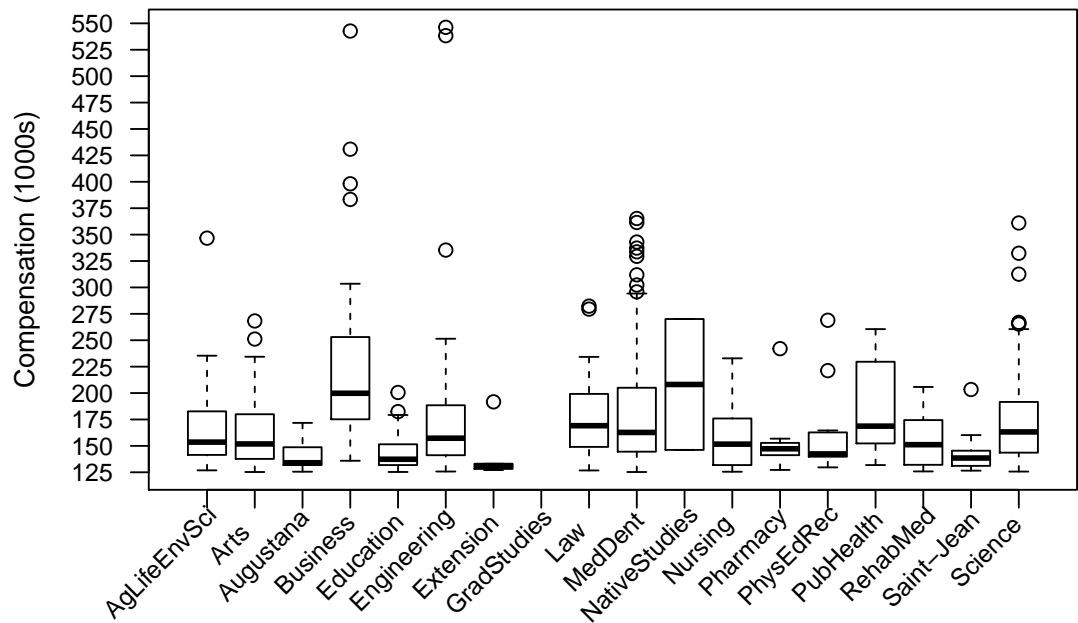
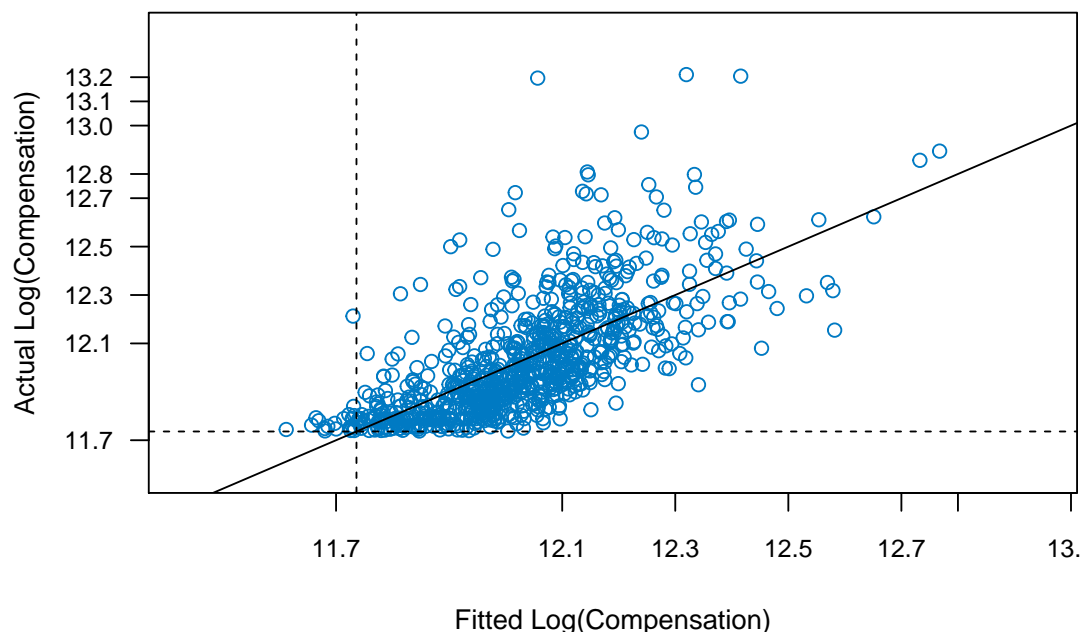


Figure B.4: Fitted versus actual $\log(\text{compensation})$ for model M6 in Table B.7 for the Professoriate without Leadership dataset.



B.2 Alternative Regression Models for the Professoriate without Leadership Dataset

As compensation data may have extreme values that are overly influential and may be outliers, three alternative approaches were also performed on the Professoriate without Leadership dataset that followed the same modelling strategy as described in Section 4:

1. $\log(\text{Compensation})$ as the response variable y . The model estimates appear in Table B.7 and the fitted versus actual $\log(\text{Compensation})$ plot appears in Figure B.4.
2. Compensation as the response variable and removed large extreme values based on model with only the equity variables. A value was removed based on a standard criterion of requiring both the studentized residual > 3 and Cook's distance $> 4/n$. The model estimates appear in Table B.8 and the fitted versus actual compensation plot appears in Figure B.5.
3. Robust regression models were used for the compensation variable (rlm in R with the psi.huber option). The model estimates appear in Table B.9 and the fitted versus actual compensation plot appears in Figure B.6.

Figure B.5: Fitted versus actual compensation for model M6 in Table B.8 for the Professoriate without Leadership dataset.

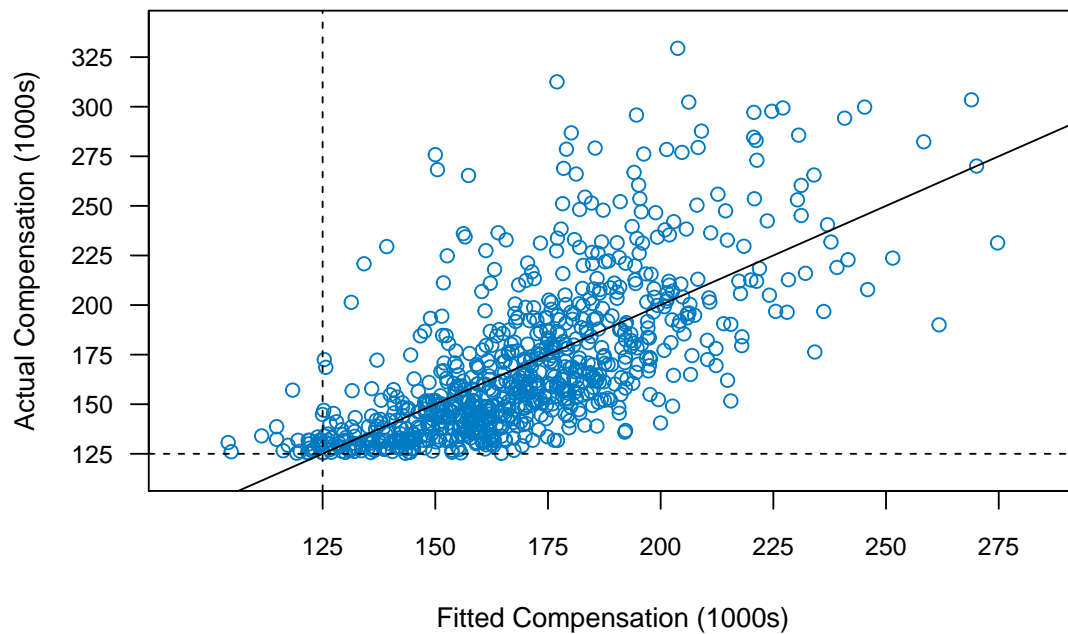


Figure B.6: Fitted versus actual compensation for model M6 in Table B.9 for the Professoriate without Leadership dataset.

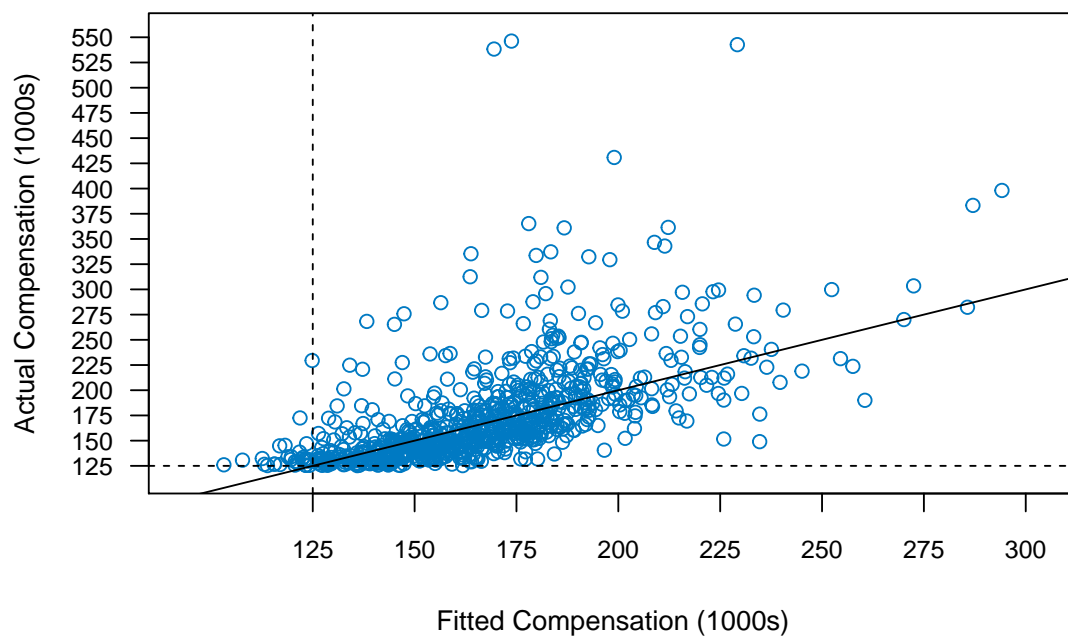


Table B.7: Log(compensation) regression models for the Professoriate without Leadership dataset.

(Total n=819: n=36 visible minority women, n=129 visible minority men, n=4 Indigenous women, n=3 Indigenous men, n=201 white women, n=446 white men)

Term	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	12.066	<0.001	11.928	<0.001	11.967	<0.001	11.695	<0.001			11.562	<0.001
Women	-0.087	<0.001	-0.075	<0.001	-0.040	0.015	-0.012	0.412			0.179	0.041
Visible Minority	-0.040	0.052	-0.023	0.245	-0.007	0.685	-0.019	0.258			0.220	0.032
Indigenous	-0.129	0.151	-0.084	0.339	-0.028	0.723	-0.061	0.472				
PhD			0.017	0.482	0.028	0.213	0.044	0.036			0.045	0.028
LLB			-0.012	0.848	-0.007	0.892	-0.136	0.073				
Years since hire			0.007	<0.001	-0.005	<0.001	-0.006	<0.001			-0.007	<0.001
Associate Professor					-0.147	0.001	0.054	0.186			0.147	0.015
Professor					0.039	0.353	0.278	<0.001			0.419	<0.001
Years at rank					0.016	<0.001	0.017	<0.001			0.017	<0.001
Agricultural, Life and Environmental Sciences							-0.023	0.495				
Arts							-0.045	0.053				
Augustana							-0.139	0.002			-0.120	0.003
Business							0.384	<0.001			0.448	<0.001
Education							-0.032	0.401				
Extension							0.004	0.962				
Law							0.179	0.017			0.100	0.034
Medicine & Dentistry							0.109	<0.001			0.150	<0.001
Native Studies							0.351	0.023			0.284	0.025
Nursing							0.008	0.856				
Pharmacy and Pharmaceutical Sciences							-0.011	0.869				
Physical Education and Recreation							-0.015	0.769				
School of Public Health							0.152	<0.001			0.172	<0.001
Rehabilitation Medicine							-0.020	0.691				
Campus Saint-Jean							-0.089	0.118				
Science							0.002	0.916				
Interaction Terms:												
Women * Visible Minority											-0.332	0.031
Women * Years since hire											0.003	0.282
Women * Associate Professor											-0.161	0.079
Women * Professor											-0.272	0.003
Women * Years at rank											-0.002	0.571
Women * Business											-0.142	0.024
Visible Minority * Years since hire											0.004	0.194
Visible Minority * Associate Professor											-0.209	0.057
Visible Minority * Professor											-0.283	0.009
Visible Minority * Years at rank											-0.004	0.341
Visible Minority * Medicine & Dentistry											-0.097	0.014
Women * Visible Minority * Years since hire											-0.024	0.004
Women * Visible Minority * Associate Professor											0.384	0.025
Women * Visible Minority * Professor											0.594	0.001
Women * Visible Minority * Years at rank											0.031	0.003
R-square	0.03		0.09		0.27		0.46		0.50		0.47	
Adj. R-square	0.03		0.09		0.26		0.44		0.45		0.46	

†Estimates not shown because of a large number of terms.

Table B.8: Compensation regression models for the Professoriate without Leadership dataset with outliers removed.

(Total n=803: n=34 visible minority women, n=127 visible minority men, n=4 Indigenous women, n=3 Indigenous men, n=199 white women, n=436 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	175524	<0.001	152559	<0.001	161607	<0.001	112772	<0.001			98133	<0.001
Women	-15448	<0.001	-13572	<0.001	-8331	<0.001	-4303	0.087			19039	0.149
Visible Minority	-8515	<0.001	-5835	0.076	-3449	0.255	-4284	0.122			44733	<0.001
Indigenous	-15520	0.286	-7720	0.583	2	1.000	-8778	0.528				
PhD			1345	0.738	3723	0.322	7495	<0.001			7105	<0.001
LLB			-2215	0.821	-1291	0.886	-30572	<0.001			-27222	<0.001
Years since hire			1259	<0.001	-471	<0.001	-720	<0.001			-661	<0.001
Associate Professor					-25845	<0.001	6680	0.319			17625	0.066
Professor					1433	0.836	40705	<0.001			58638	<0.001
Years at rank					2321	<0.001	2627	<0.001			2550	<0.001
Agricultural, Life and Environmental Sciences							-1035	0.850				
Arts							-4131	0.280			-10186	<0.001
Augustana							-18178	<0.001			-19175	<0.001
Business							66450	<0.001			66258	<0.001
Education							-1320	0.834				
Extension							7038	0.618				
Law							42542	<0.001			40207	<0.001
Medicine & Dentistry							21019	<0.001			22917	<0.001
Native Studies							71838	<0.001			107651	<0.001
Nursing							6375	0.393				
Pharmacy and Pharmaceutical Sciences							2899	0.789				
Physical Education and Recreation							2724	0.740				
School of Public Health							31288	<0.001			31239	<0.001
Rehabilitation Medicine							764	0.927				
Campus Saint-Jean							-9724	0.295				
Science							3713	0.290				
Interaction Terms:												
Women * Visible Minority											-62586	<0.001
Women * Associate Professor											-14252	0.311
Women * Professor											-30799	<0.001
Women * Arts											12900	<0.001
Women * Native Studies											-97716	<0.001
Visible Minority * Associate Professor											-40457	<0.001
Visible Minority * Professor											-50189	<0.001
Visible Minority * Medicine & Dentistry											-14366	<0.001
Women * Visible Minority * Associate Professor											55411	<0.001
Women * Visible Minority * Professor											62798	<0.001
R-square	0.04		0.11		0.25		0.45		0.49		0.47	
Adj. R-square	0.04		0.10		0.25		0.43		0.43		0.45	

†Estimates not shown because of a large number of terms.

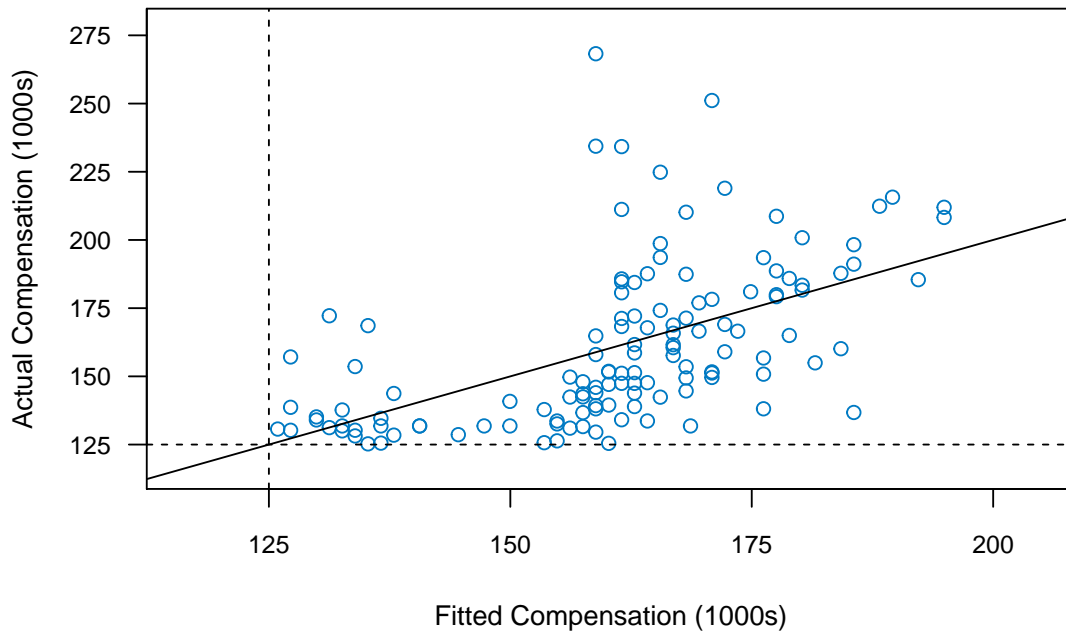
Table B.9: Compensation regression models for the Professoriate without Leadership dataset using robust regression.

(Total n=819: n=36 visible minority women, n=129 visible minority men, n=4 Indigenous women, n=3 Indigenous men, n=201 white women, n=446 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty		M5: M4 + interactions†		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	171112	<0.001	144690	<0.001	155593	<0.001	114197	<0.001			93406	<0.001
Women	-12974	<0.001	-10818	<0.001	-5143	<0.001	-2905	0.147			32270	<0.001
Visible Minority	-7201	<0.001	-4654	0.098	-2427	0.288	-2981	0.177			43046	<0.001
Indigenous	-23297	0.077	-17407	0.158	-7270	0.466	-7312	0.494				
PhD			3097	0.369	4451	0.117	7330	<0.001			6687	<0.001
LLB			662	0.936	3157	0.636	-27944	<0.001			-61989	<0.001
Years since hire			1344	<0.001	-972	<0.001	-1213	<0.001			-1255	<0.001
Associate Professor					-24089	<0.001	5573	0.304			25572	<0.001
Professor					3620	0.499	39150	<0.001			63622	<0.001
Years at rank					2957	<0.001	3225	<0.001			3180	<0.001
Agricultural, Life and Environmental Sciences							368	0.932				
Arts							-3391	0.266			-5039	<0.001
Augustana							-18237	<0.001			-19477	<0.001
Business							62495	<0.001			73253	<0.001
Education							284	0.954				
Extension							6891	0.528				
Law							41794	<0.001			71887	<0.001
Medicine & Dentistry							17050	<0.001			16869	<0.001
Native Studies							70855	<0.001			107283	<0.001
Nursing							6337	0.292				
Pharmacy and Pharmaceutical Sciences							8796	0.315				
Physical Education and Recreation							-647	0.922				
School of Public Health							32091	<0.001			31090	<0.001
Rehabilitation Medicine							3345	0.609			404	0.948
Campus Saint-Jean							-8210	0.256				
Science							2319	0.406			-109	0.965
Interaction Terms:												
Women * Visible Minority											-54391	<0.001
Women * LLB											62902	<0.001
Women * Associate Professor											-26785	<0.001
Women * Professor											-37808	<0.001
Women * Business											-29163	<0.001
Women * Law											-64507	<0.001
Women * Native Studies											-96954	<0.001
Visible Minority * Associate Professor											-44406	<0.001
Visible Minority * Professor											-52557	<0.001
Visible Minority * Rehabilitation Medicine											46554	<0.001
Visible Minority * Science											11167	<0.001
Women * Visible Minority * Associate Professor											45245	<0.001
Women * Visible Minority * Professor											60235	<0.001

†Estimates not shown because of a large number of terms.

Figure B.7: Fitted versus actual compensation for model M6 in Table B.10 for the Professoriate without Leadership dataset: Faculty of Arts only.



B.3 Faculty-Specific Regression Models for Professoriate without Leadership Dataset

This appendix provides the compensation regression models for Faculties with ≥ 100 individuals in the dataset: Arts (Table B.10), Engineering (Tables B.11 and B.12), Medicine & Dentistry (Table B.13), and Science (Table B.14).

For these regression models, model M4 does not apply because only the data for the specified Faculty were analyzed. Heuristically, models M3 and M4 would be the same. The estimates and p-values for model M5 are shown and model M6 is a reduced version of the all term model. We note that with these smaller data sets, there may not be enough data to be able to estimate all of the terms in model M5. Some of the coefficient estimates may have p-values that are inflated because of the relatively large number of model terms.

Figure B.8: Fitted versus actual compensation for model M6 in Table B.11 for the Professoriate without Leadership dataset: Faculty of Engineering only.

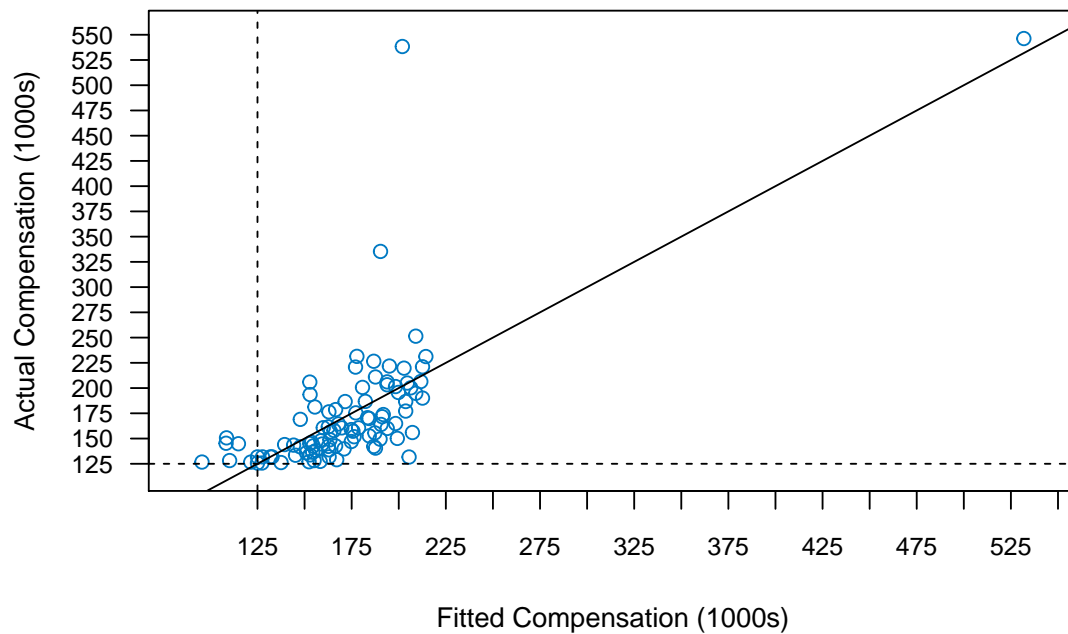


Figure B.9: Fitted versus actual compensation for model M6 in Table B.12 for the Professoriate without Leadership dataset: Faculty of Engineering and compensation < \$500,000 only.

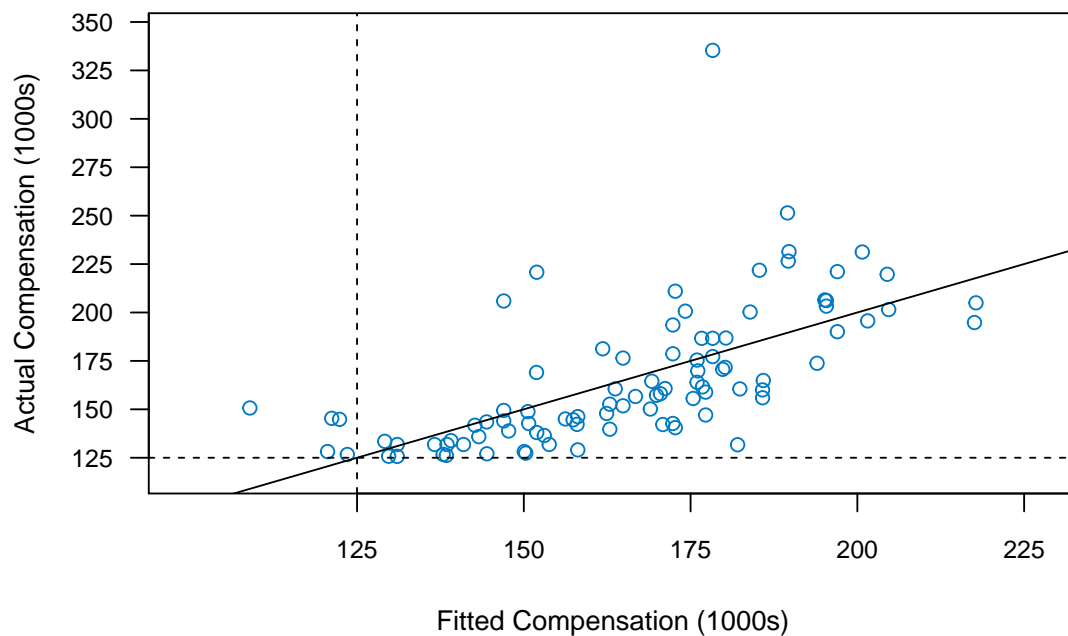


Figure B.10: Fitted versus actual compensation for model M6 in Table B.13 for the Professoriate without Leadership dataset: Faculty of Medicine & Dentistry only.

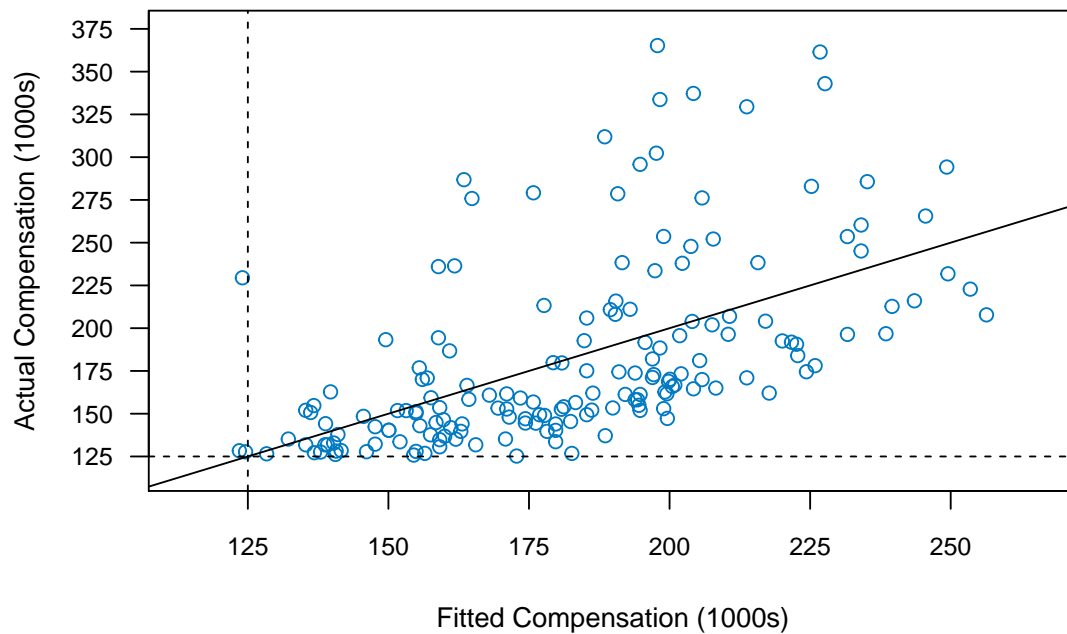


Figure B.11: Fitted versus actual compensation for model M6 in Table B.14 for the Professoriate without Leadership dataset: Faculty of Science.

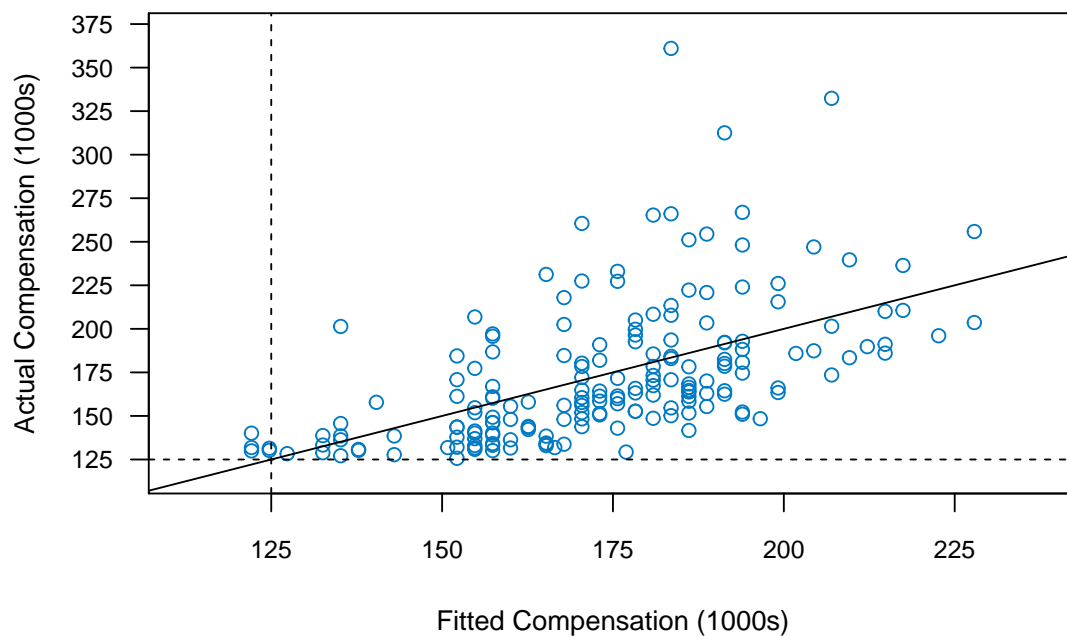


Table B.10: Compensation regression models for the Professoriate without Leadership dataset: Faculty of Arts only.

(Total n=129: n=7 visible minority women, n=5 visible minority men, n=0 Indigenous women, n=0 Indigenous men, n=51 white women, n=66 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty†		M5: M4 + interactions		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	164994	<0.001	150894	<0.001	139290	<0.001			155197	<0.001	123240	<0.001
Women	-4613	0.371	-3318	0.513	-715	0.876			-7782	0.941		
Visible Minority	-20518	<0.001	-16623	0.055	-10649	0.231			-54860	0.354		
PhD			-3269	0.664	3430	0.622			5977	0.490		
LLB			38838	0.178	24860	0.341			32890	0.253		
Years since hire			812	<0.001	-417	0.293			-1145	<0.001		
Associate Professor					-15104	0.391			-31379	0.554		
Professor					16728	0.347			5656	0.913	30268	<0.001
Years at rank					1684	<0.001			2488	<0.001	1336	<0.001
<u>Interaction Terms:</u>												
Women * Visible Minority									30010	0.767		
Women * PhD									-13583	0.417		
Women * Years since hire									1588	0.061		
Women * Associate Professor									18680	0.857		
Women * Professor									5314	0.959		
Women * Years at rank									-1999	0.066		
Visible Minority * PhD									16824	0.672		
Visible Minority * Years since hire									-155	0.979		
Visible Minority * Associate Professor									8865	0.919		
Visible Minority * Years at rank									1212	0.918		
Women * Visible Minority * Years since hire									-629	0.940		
Women * Visible Minority * Associate Professor									-8452	0.934		
Women * Visible Minority * Years at rank									931	0.942		
R-square	0.05		0.14		0.32				0.35		0.30	
Adj. R-square	0.03		0.10		0.27				0.23		0.29	

†Model not fit for Faculty-specific analyses.

Table B.11: Compensation regression models for the Professoriate without Leadership dataset: Faculty of Engineering only.

(Total n=95: n=4 visible minority women, n=47 visible minority men, n=0 Indigenous women, n=0 Indigenous men, n=3 white women, n=41 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty†		M5: M4 + interactions		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	177611	<0.001	181820	<0.001	158528	<0.001			179257	<0.001	171695	<0.001
Women	36697	0.150	36868	0.151	49011	<0.001			2876147	0.347	178706	<0.001
Visible Minority	-12664	0.342	-13419	0.326	-6610	0.587			-39664	0.193	-21088	0.385
Years since hire			-268	0.777	-5021	<0.001			-4698	<0.001	-4169	<0.001
Professor					45342	<0.001			29248	0.181	27536	0.203
Years at rank					5790	<0.001			5001	<0.001	5060	<0.001
Interaction Terms:												
Women * Visible Minority									-2933415	0.425	337453	<0.001
Women * Years since hire									-588842	0.335	-32112	<0.001
Women * Professor									5857839	0.331	372382	<0.001
Women * Years at rank									170889	0.327		
Visible Minority * Years since hire									1926	0.447		
Visible Minority * Professor									1989	0.943	7712	0.773
Visible Minority * Years at rank									-445	0.874		
Women * Visible Minority * Years since hire									501344	0.368		
Women * Visible Minority * Professor									-6276908	0.342	-230318	<0.001
R-square	0.03		0.03		0.25				0.53		0.51	
Adj. R-square	0.01		0.00		0.21				0.45		0.45	

†Model not fit for Faculty-specific analyses.

Table B.12: Compensation regression models for the Professoriate without Leadership dataset: Faculty of Engineering and compensation < \$500,000 only.

(Total n=93: n=3 visible minority women, n=47 visible minority men, n=0 Indigenous women, n=0 Indigenous men, n=3 white women, n=40 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty†		M5: M4 + interactions		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	172936	<0.001	156132	<0.001	144191	<0.001			154169	<0.001	140728	<0.001
Women	-16549	0.269	-17674	0.230	-4396	0.714			-74912	0.342		
Visible Minority	-11687	0.114	-8491	0.252	-3810	0.524			-14576	0.426		
Years since hire			1054	<0.001	-2460	<0.001			-2497	<0.001	-2454	<0.001
Professor					27377	<0.001			15381	0.240	28241	<0.001
Years at rank					4280	<0.001			4340	<0.001	4323	<0.001
Interaction Terms:												
Women * Visible Minority									102347	0.730		
Women * Years since hire									4187	0.652		
Women * Professor									4443	0.958		
Women * Years at rank									1484	0.810		
Visible Minority * Years since hire									-275	0.857		
Visible Minority * Professor									15856	0.343		
Visible Minority * Years at rank									216	0.898		
Women * Visible Minority * Years since hire									-6982	0.640		
R-square	0.04		0.08		0.42				0.44		0.42	
Adj. R-square	0.02		0.05		0.39				0.35		0.40	

†Model not fit for Faculty-specific analyses.

Table B.13: Compensation regression models for the Professoriate without Leadership dataset: Faculty of Medicine & Dentistry only.

(Total n=171: n=11 visible minority women, n=24 visible minority men, n=0 Indigenous women, n=1 Indigenous men, n=36 white women, n=99 white men)

Term	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty†		M5: M4 + interactions		M6: M5 reduced	
	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	191986	<0.001	157483	<0.001	144367	<0.001			106636	<0.001	152932	<0.001
Women	-13850	0.129	-7414	0.417	-2091	0.799			73089	0.278		
Visible Minority	-25625	<0.001	-23092	<0.001	-16334	0.066			-14854	0.780	-17314	<0.001
Indigenous	-65177	0.222	-56063	0.286	-21376	0.705			16599	0.805		
PhD			7110	0.465	9534	0.274			12447	0.308		
Years since hire			1587	<0.001	-1505	<0.001			-1345	0.113	-1544	<0.001
Associate Professor					1330	0.968			29225	0.539		
Professor					44330	0.187			84791	0.077	42913	<0.001
Years at rank					3486	<0.001			3137	<0.001	3532	<0.001
<u>Interaction Terms:</u>												
Women * Visible Minority									101258	0.243		
Women * PhD									11071	0.684		
Women * Years since hire									505	0.775		
Women * Associate Professor									-65078	0.369		
Women * Professor									-106095	0.150		
Women * Years at rank									-545	0.828		
Visible Minority * PhD									-4199	0.883		
Visible Minority * Years since hire									-607	0.789		
Visible Minority * Associate Professor									16735	0.550		
Visible Minority * Years at rank									432	0.866		
Women * Visible Minority * PhD									-1264	0.981		
Women * Visible Minority * Years since hire									-5379	0.202		
Women * Visible Minority * Associate Professor									-60408	0.183		
Women * Visible Minority * Years at rank									696	0.915		
R-square	0.06		0.12		0.32				0.36		0.31	
Adj. R-square	0.04		0.09		0.29				0.26		0.30	

†Model not fit for Faculty-specific analyses.

Table B.14: Compensation regression models for the Professoriate without Leadership dataset: Faculty of Science only.

(Total n=183: n=4 visible minority women, n=28 visible minority men, n=0 Indigenous women, n=0 Indigenous men, n=24 white women, n=127 white men)

	M1: Equity		M2: M1 + PhD, LLB, years since hire		M3: M2 + position, years at rank		M4: M3 + Faculty†		M5: M4 + interactions		M6: M5 reduced	
Term	Est	p	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	176960	<0.001	154095	<0.001	120053	<0.001			121764	<0.001	116887	<0.001
Women	-21859	<0.001	-18253	<0.001	-7621	0.283			-16322	0.694		
Visible Minority	-2610	0.733	-3738	0.610	3871	0.559			-32198	0.533		
PhD			-5047	0.768	1866	0.903			-4115	0.838		
Years since hire			1542	<0.001	-544	0.230			-830	0.148		
Professor					37072	<0.001			46463	<0.001	35289	<0.001
Years at rank					2983	<0.001			3121	<0.001	2610	<0.001
Interaction Terms:												
Women * Visible Minority									-4291996	0.212		
Women * PhD									7773	0.861		
Women * Years since hire									691	0.669		
Women * Professor									-22476	0.365		
Women * Years at rank									924	0.581		
Visible Minority * PhD									31741	0.473		
Visible Minority * Years since hire									1135	0.311		
Visible Minority * Professor									-10667	0.620		
Visible Minority * Years at rank									-986	0.567		
Women * Visible Minority * Years since hire									246904	0.211		
Women * Visible Minority * Professor									-712996	0.195		
Women * Visible Minority * Years at rank									21286	0.187		
R-square	0.04		0.13		0.32				0.35		0.31	
Adj. R-square	0.03		0.11		0.30				0.28		0.30	

†Model not fit for Faculty-specific analyses.