COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

JOHN H. COATSWORTH
PROVOST

January 27, 2014

Professor Sharyn O'Halloran
School of International and Public Affairs
International Affairs Building, Room 727

Dear Sharyn,

I hope this letter finds you well and enjoying 2014.

I am pleased to report that the Ad Hoc Committee I appointed last year to carry out a Salary Study of Officers of Research has submitted its report. I know how important it is to the University Senate as it is to the University to ensure that our Officers of Research are treated fairly and equitably.

The Ad Hoc Committee based its report on 2009-11 data. Some progress has been made since then. For example, Claude Steele had the deans reexamine the salaries of their research officers in light of the findings of a 2009 study and requested that they make adjustments as they thought necessary. In addition, my office introduced University-wide minimums for each grade of appointment as an Office of Research and worked with the schools to bring all research salaries up to at least those levels.

But we still have much work to do. One of our challenges is that the role and duties of Officers of Research vary immensely across departments and divisions, as well as between and among schools. This makes it difficult to make appropriate comparisons within this category. We know, for example, that Staff Officers of Research—staff associates and senior staff associates—perform a wide range of functions. Some execute research protocols created by their principal investigators, while others are computer programmers or work with participants in clinical trials. Similarly, we know that some Officers of Research are engaged only in conducting research while others also perform administrative functions for the sponsored research projects on which they work. There are some that serve as principal investigators themselves, while others work for a single principal investigator or work on multiple grants. Most are paid entirely from sponsored research awards, but some receive a portion of their salaries from institutional sources. These differences may serve as key drivers for appropriate variations in pay, just as they may conceal inequities that need to be addressed.

Given this context, I think it is crucial for us to understand better who our Officers of Research are, what they do, how their positions are classified and how their salaries are determined before we can reach valid conclusions about salary equity. In reaching judgments about salary equity, we will need to take into account the varying backgrounds and responsibilities of our Officers of Research, the part of the University in which they work, and the sources of their salaries. I am convinced that we cannot be assured that research salaries are equitably set without undertaking this further study.

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At the same time, however, the University will move swiftly to develop clearer policies on the salaries and salary increases given to our officers of research. Additionally, we will develop a stronger salary administration for those officers that provides a better structure for determining their compensation while continuing to provide principal investigators the flexibility they need to manage their research funds effectively. In short, we plan to collect the data we need to assess Officers of Research salary equity across the University as we move, step by step, to improve policies and administrative practices that have the potential to produce inequities.

This will be a large undertaking. It will require us to utilize the expertise of the Office of Human Resources, the Provost's Office, and the Office of the Executive Vice President for Research in developing job classifications and compensation policies. As a starting point, I have asked Vice President for Human Resources Lou Bellardine for a proposal on how this project should be structured. Lou will provide it early in the spring semester. Once I receive his proposal, I will be able to give the University Senate a timeline for its implementation.

Finally, I enclose a copy of the Ad Hoc Committee's Salary Study of Officers of Research. As has been done in the past with salary equity studies, information that might reveal individual salaries has been removed. While there may be alternative ways to interpret the data and the methodology used to analyze it, I have chosen not to address those issues in order to focus on what the University can do to implement its constructive recommendations.

Sincerely,

John H. Coatsworth

Cc: Lou Bellardine, Vice President of Human Resources
Michael Purdy, Executive Vice President for Research

# Salary Study of Officers of Research

## Ad Hoc Advisory Committee to the Provost

## Columbia University

**August 20, 2013**

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**Executive Summary**

The purpose of this study is to identify whether systematic pay differentials exist between men and women, among racial groups, and between U.S. citizens/permanent residents and non-residents among Officers of Research working at Columbia University. The study looks at Officers of Research on the Morningside campus, the Health Sciences campus, and the Earth Institute.[1] It uses qualitative analyses, descriptive statistics and multiple regression analysis to flag substantial and/or statistically significant differences in pay after controlling for individual and job-specific characteristics. The analysis looks separately at the three job families: Staff Officers of Research, Postdoctoral Officers of Research, and Professional Officers of Research. As has been done in the past with salary equity studies, information that might reveal individual salaries has been removed.

The main findings[2] of the study are:

- There is some evidence that women Officers of Research are paid less than men in two instances:
  - In the Staff ranks, women earn 5-7% less than men.
  - In the Postdoctoral ranks, women have salary differentials of -3% at the Health Sciences and -2% at the Earth Institute.
- There is evidence that some minority researchers are paid less than Whites.
  - The analysis indicates that in the Professional ranks, Asians (U.S. citizens or permanent residents) earn about 6% less than Whites if rank, which controls for job level or title within a job family, is not in the model.
  - We also find wages for Asian Staff researchers are 6-9% lower than for the baseline group.
- Non-resident aliens ("NRA") earn less than their counterparts in several cases:
  - NRA Staff researchers earn 9-11% less than White U.S. citizens or permanent residents.
  - NRA Postdoctoral researchers have an unexplained wage gap of about 4%.
  - An unfavorable wage gap of 5-8% was found for NRA Professional researchers compared to citizens and permanent residents.
- By campus, the analysis shows that:
  - For Staff, there are negative salary differentials in the Health Sciences for Asians and NRAs.
  - For Postdocs, there are salary differentials for NRAs at the Health Sciences.

[1] The Earth Institute is comprised of the Earth Institute, the Lamont-Doherty Earth Observatory, Center for Global Health, the International Research Institute for Climate and Society, CIESIN-Center for International Earth Science Information Network, and the Center for Climate System Research. Some units are located on the Morningside campus, some are at the Lamont-Doherty Earth Observatory in Palisades, N.Y., and some are at other locations.

[2] The Committee decided that it would consider criteria of both statistical and substantive significance to flag differences between comparison groups worthy of further investigation. Significance is flagged in the tables at the 0.10, 0.05, 0.01, and 0.001 levels. Substantive differences were considered noteworthy when they showed salary differentials of 5% or more, irrespective of statistical significance, if they were consistent with a pattern of findings from a group of related models.

- For Professional researchers, there is a 8% negative gap for Asians at Health Sciences and Morningside, a negative gap for NRAs of 12% at the Earth Institute and of 8% at the Health Sciences.

- There is substantial diversity in the job descriptions of Staff Researchers, both within and across campuses, suggesting that employees in this category have highly heterogeneous skills.

Based on the analysis and research, the Committee recommends that several aspects of the hiring and promotion process for salaried officers of research be strengthened:

(a) Language used in job descriptions should be standardized to facilitate comparison of salaries across positions, providing departments with guidance for salary determination and improving employees' ability to negotiate appropriate salaries;
(b) Guidelines and standards for promotion should be clarified and disseminated, as this may improve equity and negotiation;
(c) Departments should routinely report to Deans and Deans to the Provost information on average salaries by demographic characteristics in various categories (new hires; continuing employees);
(d) Data on post-docs whose salaries/stipends are set by funding agencies rather than by Columbia should be collected to assess comparability;
(e) To complement the measures above, employees should have access to additional information and training on negotiations;
(f) There is continued evidence of lower than expected salaries for women and NRAs. The literature suggests that one reason for these discrepancies may be suboptimal negotiation by these individuals during the hiring process, and once hired, ineffective navigation of the promotion process (Babcock, Laschever et al. 2003, Lieh-Ching 2006). The committee suggests that further training and resources on negotiations should be made available to Officers of Research.

Additional recommendations focus on action items related to mitigating inequities in the Staff Officers of Research group related to the lack of standardization in job descriptions, while continuing to use this job family title for the variety of job functions needed at a large research-oriented university.

(g) At the time of posting creation, Departmental HR administrators should have the responsibility of ensuring that officer of instruction duties are not included in job descriptions; where these functions are required, other job positions should be considered.
(h) Evaluation criteria for these positions should be created at the time of the job posting, and provided to the successful candidate.
(i) Officers holding the Staff Officer of Research rank are dispersed widely across all CU campuses, and have no formal networking, representation, or community to which they easily belong. It would likely decrease the probability of salary inequity if they had either some office responsible for their concerns, or a systematic way of communicating with each other. We recommend that an annual meeting of all staff associates be organized by the Executive Vice President for Research and that an executive in the Vice Provost's office be tasked with the responsibility at minimum being available as an ombudsperson.

This study was carried out by the Offices of Planning and Institutional Research and the Senior Vice Provost for Academic Administration under the auspices of an advisory committee to the Provost established for the purposes of this study. The chair of the committee was Sherry Glied, Professor (Public Health) and the members of the committee were Douglas Almond, Associate Professor (SIPA and Economics), Andy Davidson, Vice Provost for Academic Planning (Provost), Karina Davidson, Professor (Medicine), Steven Feinmark, Senior Research Scientist (Pharmacology), Yochanan Kushnir, Lamont Research Professor (Lamont-Doherty), Helen Lu, Associate Professor (Biomedical Engineering) and Kathy Neckerman, Senior Research Scientist (Social Work).

## BACKGROUND

This is the third in a series of analyses of salary equity for Officers of Research. Most recently, in 2010, an Advisory Committee submitted a study on salary equity for Officers of Research throughout Columbia, including the Health Sciences, to Provost Claude Steele. The committee used data for Research Officers as of Fall 2007 and came to the following conclusions:

Female Research Scientists earned approximately 4% less than their male co-workers and female Staff Officers of Research earned 5-8% less. NRA Staff researchers earned 7-11% less than White U.S. citizens or permanent residents, but this difference was eliminated when starting salary was included in the model. NRA Postdoctoral researchers had an unexplained wage gap of about 4% while an unfavorable wage gap of 9% was found for NRA Professional researchers compared to citizens and permanent residents when controlling for rank.

The models employed in the study included measures of age, years of experience and seniority, rank, starting salary and categorical variables for females, minorities, educational attainment and a dichotomous variable for each of the 35 departments outside the Health Sciences. Regressions were then run for Postdoctoral researchers, Staff Associates and Research Scientists separately.

Based on these findings, the Committee recommended that the Provost systematically follow up with Deans to review current salaries for Officers of Research as well as starting salaries for new researchers and to update the analysis on a regular basis.

In 2012, Provost John Coatsworth formed an advisory committee to examine the current situation for Officers of Research at Columbia. This report lays out the methodology for the study, reports on the findings and makes recommendations to the Provost based on the analysis.

## METHODOLOGY

Salary equity studies present various methodological issues. In the Columbia University context, the committee faced several particular challenges, namely:

1. The diversity of job descriptions represents a problem particularly within the Staff ranks, where two people with the same job title may be doing completely different work even within a single department. For example, it is likely that jobs requiring IT or programming expertise command higher salaries than those positions requiring basic lab work because these jobs command higher wages in the private sector.
2. Officers of Research are employed by over 100 departments throughout the university. Each department has idiosyncratic budgetary concerns and hiring practices, which complicates both statistical analysis and inference.
3. The prior analysis noted that most of the difference in salaries at a point in time were explained by differences in starting salaries. Both the determination of salaries at a point in time and of starting salaries should be addressed.
4. There were very small sample sizes for particular subgroups of interest, especially when looking at the salary distributions by campus. As a result, the statistical analysis for these populations needs to be considered with some caution.

To address concerns about the disparate position responsibilities and departmental administrative practices, the Committee explored using a full set of department dummy variables in the model specification. These dummies absorb any fixed factors at the departmental level that affect salaries, whether these factors are observed or not. In addition, to capture differences in markets, the average salary for assistant professors in the relevant departments was included in the model. We also undertook a qualitative analysis of job titles and content for Staff Officers of Research, and the findings are included as part of this report.

Since concern exists about the relationship of an employee's initial negotiated salary to their current salary circumstances, this variable was added to the model. A model was also specified for the most recently hired Officers of Research where starting salary itself was the dependent variable. Furthermore, the data were analyzed by looking at Officers of Research who had been at Columbia fewer than 5 years compared to those who have been at the University for 5 or more years in order to understand whether newer employees have had different hiring experiences than longer-term employees.

Finally, to maximize sample size and thereby statistical precision, the analysis includes three years of salary data. We observe multiple salary records for many employees across the three years. Because these multiple records for the same employee are not statistically independent, we need to increase the standard errors of the point estimates to account for this effect. Therefore, we use the "cluster" command in Stata to account for statistical correlation within employee (i.e. we cluster standard errors using the unique employee identifier). This procedure does not change the point estimates themselves. Nor does it eliminate challenges associated with detecting effects for small sub-groups of interest.

The sources of funding for Officers of Research, the wide variation in types of appointments and work responsibilities as well as recent changes in minimum salary requirement policies required great care in the initial data assembly. For this reason, the current cross-sectional study of Officers of Research is an important step towards understanding their remuneration history at the University.

The preceding caveats notwithstanding, we believe that to a large extent, wages are set by market forces (supply & demand) and by individual productivity.[3] Since productive capacity cannot be estimated directly, educational attainment, and measures of work experience are used as proxies. A person's rank can also be a measure of productive capacity, but promotions may also be a means of discrimination. To capture both possibilities, we estimate regressions without and with rank.

[3] The following excerpt was extracted from the **Columbia University Faculty Handbook**: "The individual Faculties follow separate programs for determining the levels of salary appropriate to recruit and retain officers of research in their respective disciplines and for ensuring that officers with similar experience and training receive comparable salaries…Initial salaries vary according to the experience and skills of the officers. They also reflect the pattern of compensation in the officer's discipline and the level of funding provided by the grants and contracts supporting the projects on which the officer is working…Merit increases are considered once a year...Promotional increases are considered concurrently with an advancement to a higher grade of office."

## Dataset

The analysis includes data for all full-time, salaried Officers of Research with appointments as of Fall 2009, 2010, or 2011 who work at CUMC, on the Morningside campus, or at the Earth Institute. The data exclude part-time Officers of Research and Officers of Research whose salaries are externally determined and not affected by university policy.[4]

Frequency data, organized by campus, are summarized in Table 1.

**Table 1. Distribution of Officers of Research by Job Family and Campus**

| | CUMC | MS | EI | Grand Total |
|---|---|---|---|---|
| **Staff Officers of Research** | | | | |
| Count | 738 | 181 | 248 | 1167 |
| % of total | 14% | 3% | 5% | 22% |
| **Postdoctoral Officers of Research** | | | | |
| Count | 1111 | 775 | 143 | 2029 |
| % of total | 21% | 15% | 3% | 38% |
| **Research Scientists & Scholars** | | | | |
| Count | 1217 | 520 | 413 | 2150 |
| % of total | 23% | 10% | 8% | 40% |
| **Total Count** | **3066** | **1476** | **804** | **5346** |
| **Total % of total** | **57%** | **28%** | **15%** | **100%** |

A total of 5,346 Officers of Research employee records are included in the study. Of these just over 57% are at CUMC, 28% on Morningside, and about 15% are at the Earth Institute. Twenty-two percent are Staff, 38% are Postdocs, and 40% are Professional Researchers.

The following variables were employed in the study:

## Dependent Variable

Salary

The main variable of interest in the analysis is the salary of the employee in each of the 3 years included in the study, Fall 2009, Fall 2010 and Fall 2011.

Most regressions in the study use the natural log of base salary as their dependent variable. This is a standard approach used in salary studies to address non-linearities in the data created by the multiplicative nature of salary increases and the presence of positive outliers. In addition, regressions were run using the natural log of starting salary as the dependent variable.

[4] The committee was asked to study the stipends of post-doctoral research and clinical fellows who receive stipends as well as post-doctoral research scientists/scholars who receive a salary. The committee found that very few of those officers receive their stipends through the University. The remainder are funded directly by an external source. Since their stipends are not systematically tracked in the University's administrative systems, the committee concluded that it did not have sufficient data to conduct an equity analysis for the fellows. It recommends instead, that the University collect information on their stipends so that they can be included in future studies.

## Independent Variables

### *Employee Characteristics*

Gender:
Women were coded as 1 and men as 0.

Race/Ethnicity:
Dummy variables were created for Hispanics, Blacks and Asians who are U.S. citizens and permanent residents.

US Residency Status:
Non-resident aliens of all racial groups were considered separately, in conformity with federal reporting guidelines (they were not coded as belonging to any racial/ethnic group). U.S. citizens and permanent residents (green-card holders) are compared to Officers of Research under any visa status (EA, F-1, G-1, H-1B, J-1, O-1, PL, SP and TN). The dummy variable NRA is coded as 1 for non-resident aliens and 0 for citizens and permanent residents.

### *Rank*

Officers of Research can be assigned to three populations with different general profiles: Staff, Postdoctoral and Professional Research Scientists and Scholars. Staff includes Staff Associates and Senior Staff Associates. Postdocs is its own category, and Professional Researchers includes Associate Research Scientists and Scholars, Research Scientists and Scholars and Senior Research Scientists and Scholars. Rank was coded as follows:

*Staff*: Staff researchers were left as is: Staff Associate and Senior Staff Associate. This is, in some sense, its own pipeline as Staff Officers of Research generally do not move up the ranks into the Research Scientists group.

*Postdocs:* Includes Postdoctoral Research Scientists and Scholars. Postdoctoral appointments are limited by University policy to no more than five years. Most leave the University after completing their appointment. Those who remain are typically appointed as Associate Research Scientist.

*Research Scientists:*
Associate Research Scientists: Includes Associate Research Scientists and Scholars, as well as Named Associate Research Scientists and Scholars.

Research Scientists: Includes Research Scientists and Scholars, as well as Named Research Scientists and Scholars.

Senior Research Scientists: Includes Senior Research Scientists and Scholars, as well as Named Senior Research Scientists and Scholars.

***Experience***

Education:
Educational attainment is included in the analysis as a proxy for productivity. While Staff may have a range of educational degrees, the majority of scientist or scholar officers possess a Ph.D. or its equivalent, but enough variation exists for this variable to have explanatory power and thus be included in the model. The different academic degrees reported in the raw Human Resources data were grouped as outlined in Appendix C. The resulting categories were Bachelors or less, Masters Degree, Professional Degree and Ph.D.

Years Since Degree:
Although individual employment histories may be inconsistent and contain gaps, we took the number of years since attainment of the person's highest degree as a proxy for work experience. The variable is divided by 10 to facilitate the interpretation of its impact.

Because Years Since Degree is highly correlated with age and years of experience at Columbia, we did not include these as demographic variables in the analysis.

***Market Effects***

We created groups of departments to control for market forces that vary by discipline. These discipline categories are similar to the academic structure of the university. We used our judgment in assigning centers and interdisciplinary institutes to one of the academic divisions. The Earth Institute and its affiliated centers employ a large number of Officers of Research, and were coded as one category. Please refer to Attachment 1 for the complete list of departments in each institutional division as well as their respective headcounts: Humanities & Social Sciences, Natural Sciences, Morningside Professional Schools (other than Engineering), Engineering, Basic Health Sciences, Clinical Health Sciences, and Public Health.

Another measure used in the analysis to reflect variation in markets is department. In some cases, departments were grouped together in appropriate groupings was so that the size of the groups was reasonable. A list is attached as Attachment 2.

***Starting Salary***

When studying salary discrepancies over time, it is useful to discern if existing pay gaps are the result of inequitable starting salaries or differences in salary increases over time. To answer this question, we included the log of starting salary as an independent variable in one of the specifications of the model. It stands to reason that an employee's current salary (the independent variable) will be largely determined by their salary when first starting as an Officer of Research because the dollar amount of subsequent salary increases which are given in percentage terms are a function of starting salary. By comparing regression models with and without starting salary, one can tell if the differences in salary between men and women and race groups may be explained by differences in starting salary, e.g., if differentials disappear when starting salaries are included in the models. If shortfalls persist even when starting salaries are included, this may reveal differential rates of salary growth over time.

In addition, we ran a separate analysis using starting salaries as the dependent variable for employees whose time at Columbia was less than 1 year.

### Qualitative Analysis

We examined job descriptions for the Staff Associate positions, which appeared to be relatively heterogeneous in skill level. Our initial proposal was to use a qualitative coding approach to categorize these positions on a number of dimensions, and then to examine salary equity on the basis of the resulting coding. One member of the task force reviewed the 60 CUMC current Staff Associate job descriptions, and a second member reviewed the 40 current Morningside and 20 current Earth Institute descriptions. This review revealed substantial heterogeneity in level of independence required, responsibilities, and skills required to successfully fulfill the duties of the position, and neither could propose a reasonable set of formal coding. The diversity of skills required across different departments and the variation in independence meant that only basic descriptive data such as the number of positions by department could be provided. Thus, a purely qualitative overview is provided below, although we have provided concrete recommendations about steps that could be taken to allow some standardization of Officer of Research job descriptions in the future.

## FINDINGS

### Salaries, Educational Attainment and Experience

Men and women differ from each other not only in their salaries, but also in some of the variables correlated with productivity such as experience and seniority. The raw data shows that the average salary for women is lower than for men for Staff and Professional Researchers. In addition, Years Since Degree and Years at Columbia for Staff and Years Since Degree, and Years at Columbia for Research Scientist/Scholars are slightly lower for women than for men. The Average Salary and Years at Columbia measures for Postdocs are fairly comparable for men and women.

In general, we have sufficient sample for considering gender, even within Campus and job category. That said, there are fewer than one hundred female staff employee-by-year records for Morningside Heights and the Earth Institute.

A comparison of average salary and experience measures across racial groups and non-resident aliens shows that for Staff on All Campuses, the salary for NRAs is less than Whites; the experience measures for NRAs are lower as well. Asian Staff also have a gap in salary, but Years Since Degree and Years at Columbia are comparable to Whites. There are similar differences for Professional Researchers. Differences across racial groups for Postdocs are not big due to the nature of the appointment.

When race is considered, small cell sizes become more of an issue. The number of Blacks never exceeds 50 for a given position and campus (29 staff at Health Sciences is the highest). Likewise, the number of Hispanics is also limited (maximum of 56 staff, again at Health Sciences). The number of Asians is substantially higher, but limited at the Earth Institute: 32 Staff, 2 Postdocs, and 54 Professional researchers. NRAs are in general more numerous.

## REGRESSION ANALYSIS

Clustered regression analysis was performed separately on the three Officer of Research job families.

Several models were specified for Staff, Postdocs, and Professional Researchers. Within each population, regressions were run by campus. The three campuses in the analysis are: Health Sciences, Morningside, and the Earth Institute[5].

Following is an overview of the models specified and the rationale behind them:

- Model 1: This model contains the basic demographic and experience variables and dummies for each academic division
- Model 2: Model 1 but replacing academic division dummies with dummies for departments
- Model 3 (for Staff and Research Scientists only): Model 2 plus a dummy variable for Senior Staff Associate in the case of Staff, and Researcher and Senior Researcher in the case of Research Scientists. This model was not run for Postdocs because there is no rank variable for this job family.
- Model 4: Model 2 plus the log of starting salary. As explained above, this variable is added to add explanatory power to the model and to determine whether salary discrepancies are a result of gaps in starting salaries, different rates of salary growth or both.
- Model 5: Model 2 using starting salary as the dependent variable.

The natural log of salary is the dependent variable for Models 1-4 and, as noted, the natural log of starting salary is the dependent variable in Model 5. The interpretation of the regression is the percentage change in salary for one unit change in the independent variable. We measure statistical significance at the three widely-used levels across the social sciences: .10, .05 and .01. In general, discussion of the results focuses on situations where a group is earning statistically significantly less that the base group, but it is noted when the coefficient is positive.

*Caveats*: It is important to note that changes between Models 2 and 3, where rank is included, are difficult to interpret because of the possibility that promotions from one rank to the next are not unbiased. Similarly, the inclusion of log of starting salary in Model 4 must be interpreted with care. The assumption for this analysis is that there are no differences across Race, Residency Status, or Gender in the determination of starting salaries.[6]

[5] As described in an earlier footnote, the Earth Institute is not formally a campus as several of its units are on the Morningside campus and others are located at the Earth Observatory, but it can be considered one for the purposes of salary.

[6] If any subsequent reviews of these measures reveal problems, they should be taken into account in future salary studies for Officers of Research. In the case of any analysis of starting salaries, the most convincing analysis would include, if possible, all employees in a particular entering cohort, even those who have since left the institution. Ideally, such an analysis would also take into account the nature of previous positions and specialized expertise required of specific positions.

The following table shows the variables included in each of the models the committee developed to evaluate research salaries throughout the University.

Table 2a
Determinants of Salary
All Campuses & Division

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| | *Division* | *Dept* | *Rank* | *StartSal* | *Start Sal as depvar* |
| Female | x | x | x | x | x |
| Asian | x | x | x | x | x |
| Black | x | x | x | x | x |
| Hispanic | x | x | x | x | x |
| Non-resident Alien | x | x | x | x | x |
| Education | x | x | x | x | x |
| Experience | x | x | x | x | x |
| Year Dummies | x | x | x | x | x |
| Average Assistant Professor Salary (Log) | x | x | x | x | x |
| Division dummies | x | | | | |
| Department dummies | | x | x | x | x |
| Starting Salary (Log) | | | | x | |
| Rank | | | x | | |

The committee used a different set of determinants to study the salaries by campus.

Determinants of Salary
By Campus

| | Model 2 HS | Model 2 MS | Model 2 EI |
|---|---|---|---|
| Female | x | x | x |
| Asian | x | x | x |
| Black | x | x | x |
| Hispanic | x | x | x |
| Non-resident Alien | x | x | x |
| Education | x | x | x |
| Experience | x | x | x |
| Year Dummies | x | x | x |
| Average Assistant Professor Salary (Log) | x | x | x |
| Department dummies | | x | x |

**Staff Officers of Research**

The analysis for Staff researchers yields several findings:

- We find evidence of salary differences for women of 5-7% less than men.
- We also find indications of wage gaps for Asian (6-9%) and non-resident alien (9-12%) Staff researchers.
- By campus, the analysis finds a salary differential for Asians and NRAs in the Health Sciences and women Staff Officers of Research at Morningside and the Earth Institute.

*Model 1:* When rank is excluded, several predictors showed a statistically significant relationship with current salary compared to our baseline group (White, US citizen or permanent resident, male with a Bachelor's or less and working in the Clinical Health Sciences (CHS)). All else equal, Female Staff researchers earn about 8% less than men. Asian Staff researchers earn almost 9% less than their non-Asian colleagues with comparable characteristics. Model 1 also shows that non-resident aliens earn 11.7% less than U.S. citizens and permanent residents. This model explains 25.5% of the variation in salary.

*Model 2:* Using department dummies in the model does not change the demographic coefficients of interest or their magnitude in any important way. This model explains 39.3% of the variation in salary.

*Model 3:* When including a variable for Rank, the coefficients for female, Asian and NRA remain statistically significant when rank is introduced to the model though coefficients diminish in magnitude. This model explains 57.4% of the variation in salary.

*Model 4:* The interpretation for the Log of starting salary coefficient is not straightforward, and it is introduced in order to parse out the two components of current salary: starting salary and salary increases. In particular, if a coefficient loses significance from Model 3 to Model 4, one can assert that the observed discrepancy in current salary was produced by a gap in starting salary, and not in the rate of salary increase. Predictors that remain significant once the starting salary variable has been introduced suggest that starting salaries AND salary raises over time are different for this group.[7] For Staff, the effects found in the previous models for women, Asians and NRA's remain statistically significant. This model explains 51% of the variation in current salary.

*Model 5:* Using the log of starting salary as the dependent variable, the effects found in the previous models for women, Asians and NRA's are no longer statistically significant. The magnitude of the coefficient for women is comparable to that in the other models, but they are much lower NRAs and reverse sign for Asians. This model explains 35.7% of the variation in salary.

*Model 2 By Campus:* Analysis of Model 2 by campus show that both Asian and NRAs have statistically significant negative coefficients greater than 5% in the Health Sciences. NRAs also have a statistically significant and positive coefficient greater than 5% at the Earth Institute; Hispanics earn over 5% less at Morningside and the Earth Institute, but these differences are not statistically significant. On the Morningside campus, coefficients for Female and Hispanic are greater than 5% and negative but only Female is statistically significant. The coefficient for Black is greater than 5% and negative at CUMC, and is statistically significant.

**Postdoctoral Officers**

The analysis of Postdocs reveals that:

- Women have a salary differential of 2%.
- Non-resident aliens have about 4% lower salaries than U.S. citizens/permanent residents.
- By campus, there are salary differentials for NRAs and Hispanics at Health Sciences. For women; there is a salary differential of about 2.5% at the Health Sciences and the Earth Institute.

[7] The relationship between starting salary and current salary is not one to one because there is variability in the rates of promotion, department of employment and other factors that are accounted for in the error term ε. For example, two "identical" employees in 2011 hired in 1995 may have been promoted in different years, so that the differences in their current salaries is partly due to differences in starting salaries and partly to other factors. As can be expected, the relationship between starting salaries and current salaries weakens over time.

- Controlling for starting salary lessens the differences all else equal, which implies that differences in current salary may be related to differences in starting salaries.

*Model 1:* According to the model, an NRA earns 4.6% less than an identical U.S. citizen or permanent resident. Women earn about 2% less than men. This model explains 26.1% of the variation in salary.

*Model 2:* Using department dummies in the model lessens the magnitude of the coefficients in the model slightly. This model explains 39.6% of the variation in salary.

*Model 4:* With the addition of starting salary to the model, the coefficient for NRAs is smaller but still statistically significant. This suggests that the salary differential in current salary for NRAs is explained by starting salary which is consistent with the fact that Postdocs only stay in these positions for 2-5 years. This model explains 53.3% of the variation in salary.

*Model 5:* Using starting salary as the dependent variable, we see that the coefficient for NRA's is 4% and statistically significant. The coefficient for Black is 10% and positive. This model explains 39.2% of the variation in salary.

*Models 2 By Campus:* Analysis of Model 2 for the Health Sciences, Morningside, and Earth Institute shows that Hispanics and NRAs (greater than 5%) have statistically significant negative coefficients in the Health Sciences. The coefficient for Female indicates that women earn about a statistically significant 2.5% less than men at CUMC and the Earth Institute.

**Research Scientists and Scholars**

- This set of models provides no clear evidence that women Research Scientists systematically have lower salaries than men.
- The analysis indicates that there is a 5-8% wage gap for Asian Research Scientists.
- The analysis also shows that NRAs are paid 5-8% less than citizens and permanent residents across the various models.
- By campus, there is a 13% gap for Hispanics at Morningside and an 8% gap for Asians at CUMC and Morningside. The analysis by campus indicates that NRAs at the CUMC and Morningside have salaries 8% and 12% lower, respectively, than the baseline group.

*Model 1:* The baseline individual for this group is a White U.S. citizen or permanent resident male with a Doctoral degree and working in the Clinical Health Sciences. Asians and non-resident aliens receive salaries that are 8.4% and 7.8% lower than the baseline group, respectively. This model explains 46.9% of the variation in salary.

*Model 2:* Using department dummies in the model does not change our coefficients of interest or their magnitude in any important way. This model explains 57% of the variation in salary.

*Model 3:* Once rank is controlled, our coefficients of interest or their magnitude do not change in any important way. This model explains 64.6% of the variation in salary.

*Model 4:* Once starting salary is controlled, our coefficients of interest or their magnitude do not change in any important way. This model explains 61.6% of the variation in salary.

*Model 5:* When starting salary is the dependent variable, the coefficient for Blacks is -21% (based on a very small sample), but otherwise our coefficients of interest are not statistically significant. This model explains 37.9% of the variation in salary.

*Models 2 By Campus:* For Model 2 at CUMC, earnings for Asian and NRAs are more than 5% below those of Whites and the difference is statistically significant. The coefficient for Female is smaller, but also statistically significant. At Morningside, Asians and Hispanics earn over 5% less than Whites and the differences are statistically significant. At the Earth Institute, NRAs earn over 5% less than Whites (also statistically significant).

Overall, the regression analyses reveal that even when starting salary was taken into consideration, apparent differences in salary persisted for women, as well as for Asian Americans and Non-resident Aliens (NRA).

## QUALITATIVE ANALYSIS RESULTS

We reviewed job descriptions of Staff Associates for each campus.

*Morningside Results*

These 40 positions reviewed include jobs in Physics, Engineering (including Computer Science, Chemical Engineering, Biomedical Engineering, Earth and Environmental Engineering, and Electrical Engineering), Economics, Law, Anthropology, Political Science, the Harriman Institute, ISERP, Committee on Global Thought, Social Work, Biology, and Chemistry.

A non-trivial number of job descriptions simply quoted the generic category description for Staff Researcher, which may suggest either that there was a candidate in hand or that few or no specialized skills were required. This was less prevalent for the Earth Institute job descriptions. The positions varied in the level of independence expected of the employee. Some staff associates were expected to "assist with" various tasks, while others were expected to train and supervise other employees, work unsupervised, or in one case to "exercise substantial level of creativity and independence."

Some staff associates were being recruited for what might be described as generic research tasks – project management, literature reviews, report and grant proposal writing, conference planning, website updates, and outreach and relationship building. Other jobs were more field-specific, such as performing genetic crosses of fruit flies or developing industrial grade morphological disambiguators/taggers. The social science Staff Associate positions may involve skills (qualitative research, IRB preparation, panel data analysis) that are less discipline-specific than the natural/physical science jobs, although this conclusion is tentative since there are relatively few of these positions. In addition, it is apparent that some jobs required more advanced skills than others. For instance, more than one job included data entry; seemingly at the other extreme were positions involving Java and ObjectiveC programming or the design/visualization, maintenance of, and upgrades to mathematical models of large scale multi-physics systems. One position required experienced software engineer.

*Earth Institute Results*

The 20 positions at Earth Institute were also fairly heterogeneous.

As at Morningside, more independence was expected for some positions than others. Some staff associates were expected to work with general or limited supervision, to exercise independent judgment, and to train and supervise junior employees. Others were to work "in close coordination with PIs" or under the supervision of more senior staff.

A number of the positions were for jobs involving policy analysis or use of demographic or spatial data. These positions appeared to require generic social science research skills with a range of complexity, including sampling, survey design and management, data entry, data cleaning, data analysis with widely-used statistical packages (SPSS, Stata), data management and delivery, graphical presentation, mapping, and report writing.

Other positions involved use of scientific instruments for taking field or lab measurements of environmental phenomena. Although these positions probably vary in the complexity of the work, the skills involved seem to be more specialized than for the other EI positions. The following are excerpts from the descriptions for five different jobs:

- Designs, develops, implements and maintains electrical, mechanical or specialty-based solutions to engineering or science problems and applications in the context of marine scientific instrumentation and data.
- Manages, operates and maintains the multi-instrument Stable Isotope Ratio Mass Spectrometry (SIRMS) facility for the analysis of carbonates, water, and organic compounds.
- Prepares and processes sediment, ice and particulate matter samples for naturally occurring radionuclides (U, Th isotopes, noble gas isotopes (3He) and Rare Earth elements. Involves extensive wet chemistry, including sample dissolution using strong mineral acids, together with elemental purification by ion exchange, solvent extraction and other methods, as needed.
- Conduct research investigating methods to determine spectra of vertical strain from CTD and/or LADCP data and carry forward the preliminary analysis.
- The position will be involved in the processing and analysis of spatial reference data from a ground based and airborne ice imaging system. The position will be responsible for instrument selection, calibration, data collection, quality control and analysis during a field season and of the dissemination of post-processed spatial reference data for use by the sensor groups within the main group.

*CUMC Results*

The 40 positions at CUMC had a similar level of heterogeneity as that seen in the Morningside and Earth Institute positions. The departments using this title included Neuroscience, Pharmacology, Neurology, Pathology, Medicine, Dermatology, Biomedical Informatics, Anesthesiology, Physiology, Microbiology, OB/GYN, Biostatistics, Population & Family Health, Radiology, Psychiatry, Biochemistry & Molecular Biophysics, Lamont divisions, and General Dentistry. Centers and Institutes using this title included the Herbert Irving Comprehensive Cancer Center, Sergievsky Center, Center for Infection & Immunity, C2B2,

Taub Institute, Center for Radiologic Research, and Institute for Cancer Genetics, Irving Institute.

There were several generic staff associate job descriptions used among these 40, but the large majority described a very specific job function needed by the department and/or Center, making classification again very difficult. There appeared to be an even larger range of independence expected in these job descriptions than in those from Morningside or the Earth Institute. Some postings required conducting independent animal surgery, others listed providing written reports of research, presenting findings and convening meetings of the research teams, managing a staff of 6 research assistants and multiple health educators, implementing educational programs, planning and performing imaging procedures, designing, executing, evaluating experiments independently with limited input from the PI, to contributing to publications, disseminating findings, assisting with pathology diagnoses, and aiding in the supervision of graduate students. At the same time, there were descriptions that included data entry, keeping minutes, and filing source documents.

Similarly, the skills sets required for some job descriptions were so specific as to appear to describe a specific person, such as specifying the number of years of related experience, the type of degree, and the type of assaying experience, while others were so generic as to make it difficult to understand the actual job, such as " domestic travel…oversight of studies….perform experiments…support PI" (all of these phrases occurred without sufficient clarifying language to provide a context for the phrase).

In conclusion, the Staff Associate job position is clearly required to cover many needed and essential job functions at CUMC, but the diversity of tasks, skills, and functions defies the categorization needed to further investigate if salary inequities are occurring for women, minorities, ethnicities, or other potentially disadvantaged groups.

## RECOMMENDATIONS

Based on the analysis and research, the Committee recommends that several aspects of the hiring and promotion process for salaried officers of research be strengthened:

(a) Language used in job descriptions should be standardized to facilitate comparison of salaries across positions, providing departments with guidance for salary determination and improving employees' ability to negotiate appropriate salaries;
(b) Guidelines and standards for promotion should be clarified and disseminated, as this may improve equity and negotiation. Attachment 3 provides guidance on best practices for promotions based on practices at Lamont-Doherty;
(c) Departments should routinely report to Deans, and then Deans should report to the Provost summary information such as average salaries by demographic characteristics in various categories (new hires; continuing employees);
(d) Data on post-docs whose salaries/stipends are set by funding agencies rather than by Columbia should be collected to assess comparability;
(e) To complement the measures above, employees should have access to additional information and training on negotiations;

(f) There is continued evidence of lower than expected salaries for women, Asians and NRAs. The literature suggests that one reason for these discrepancies may be suboptimal negotiation by these individuals during the hiring process, and once hired, ineffective navigation of the promotion process (Babcock, Laschever et al. 2003, Lieh-Ching 2006). The committee suggests that further training and resources on negotiations should be made available to Officers of Research (see Attachment 4).

As the qualitative analysis illustrated, the lack of standardization and the resulting heterogeneity of the Staff Associate position leaves it particularly vulnerable to potential inequities. Our additional recommendations focus on action items that could mitigate this possibility, while continuing to use this job family title for the variety of job functions needed at a large research-oriented university.

(g) At the time of posting creation, Departmental HR administrators should have the responsibility of ensuring that officer of instruction duties are not included in job descriptions; where these functions are required, other job positions should be considered.
(h) Evaluation criteria for these positions should be created at the time of the job posting, and provided to the successful candidate.
(i) Officers holding the Staff Officer of Research rank are dispersed widely across all CU campuses, and have no formal networking, representation, or community to which they easily belong. It would likely decrease the probability of salary inequity if they had either some office responsible for their concerns, or a systematic way of communicating with each other. We recommend that an annual meeting of all staff associates be organized by the Executive Vice President for Research and that an executive in the Vice Provost's office be tasked with the responsibility at minimum being available as an ombudsperson.

The committee also noted that while there was little evidence of systemic bias in salaries around Black and Hispanic employees, it was difficult to investigate this question because these groups are substantially under-represented in officer of research positions. The committee urges the University to take steps to improve the pipeline of minority officers of research.

# Attachment 1: Departments within Division/School

**Columbia University**
**Academic Divisions and Departments by Campus**

## CUMC

- Basic Health Sciences
  - Biochemistry and Molecular Biophysics
  - Center of Neurobiology and Behavior
  - Ctr Mol Recognition
  - Genetics and Development
  - Institute of Human Nutrition
  - Joint Ctr for System
  - Microbiology
  - Pathology
  - Pharmacology
  - Physiology and Cellular Biophysics
  - Taub Inst For Research On Alzheimers Disease
- Clinical Health Sciences
  - Anesthesiology
  - Biomedical Informatics
  - Center For Radiological Research
  - Center of Medicine a
  - Dental Medicine
  - Dermatology
  - Institute For Cancer Genetics
  - Institute of Cancer Research
  - Institute of Comparative Medicine
  - Irving Comp Cncr Ctr
  - Irving Inst Clin/Tra
  - Medicine
  - Medicine-Cardiology
  - Medicine-Pharm/Exper Therap
  - Naomi Berrie Diab Ct
  - Neurological Surgery
  - Neurology
  - Neurology-General Neurology
  - Neurology-Merritt Center
  - Obstetrics and Gynecology
  - Ophthalmology
  - Orthopedic Surgery
  - Otolaryngology
  - Pediatrics
  - Psychiatry
  - Psychiatry-Epi Menta
  - Radiation Oncology
  - Radiology
  - Rehabilitation Medicine
  - School of Nursing
  - Sergievsky Center
  - Surgery
  - The Center For Family Medicine
  - Urology
- Public Health
  - Biostatistics
  - Center for Children's Environmental Health
  - Department of Health Policy and Management
  - Environmental Health Sciences
  - Epidemiology
  - Heilbrunn Department of Population and Family Heal
  - MSPH - ICAP
  - MSPH - NCDP
  - MSPH - PopAndFamilyHea
  - MSPH BiostatisticsThompson
  - MSPH Centers-NCCP
  - MSPH Ctr Infection &
  - Sociomedical Sciences

## Morningside

- Humanities & Social Sciences
  - Anthropology
  - Art History and Archaeology
  - Arts and Sciences (intrdept.)
  - Center for International Conflict Resolution
  - Center for Iranian Studies
  - Cmtee Asia/Mid East
  - Ctr For Global Thoug
  - Ctr Us-China Art Exc
  - East Asian Institute
  - East Asian Languages and Cultures
  - Economics
  - English and Comparative Literature
  - Germanic Languages
  - Harriman Institute
  - History
  - Inst for Cmprtve Lit
  - Inst for the Stdy Hu
  - Inst Israel & Jewish
  - Inst Scl & Eco Rsrch
  - Middle East Institute
  - Middle Eastern Languages and Cultures
  - Music
  - Ofc Of The Provost
  - Philosophy
  - Rare Bk&Man Library
  - Religion
  - School of International and Public Affairs
  - Theatre
- Natural Sciences
  - Astronomy
  - Biological Sciences
  - Chemistry
  - Col Astrophysics Lab
  - CU Radiation Labs
  - Ecology, Evolution and Environmental Biology
  - Nevis Laboratories
  - Physics
  - Psychology
  - Statistics
- Engineering
  - APAM-Goddard Inst Sp
  - Applied Physics and Applied Mathematics
  - Biomedical Engineering
  - Chemical Engineering
  - Civil Engineering and Engineering Mechanics
  - Computer Science
  - Ctr Int Sci & Eng
  - Earth and Environmental Engineering
  - Electrical Engineering
  - Mechanical Engineering
  - SEAS-Ctr Comp Learni
- Professional Schools
  - Columbia Business School
  - Parker School of Foreign and Comparative Law
  - School of Journalism
  - School of Law
  - School of Social Work

## Earth Institute

- Ciesin
- Ctr Climate Sys Rsch
- Ctr Env Res & Consrv
- Earth Institute
- EI - Ctr Glbl Hlth &
- IRI Climate & Societ
- LDEO-Admin, Facil &
- LDEO-Biology Paleoen
- LDEO-Geochemistry
- LDEO-Marine Geology
- LDEO-Ocean & Climate
- LDEO-Office Marine O
- LDEO-Seismology/Geo/

# Attachment 2: Department Dummy Groupings

**Columbia University**
**Department Dummies and Departments**

| Code | Department Name |
|---|---|
| d1 | Biochemistry and Molecular Biophysics |
| | Ctr Mol Recognition |
| d2 | Genetics and Development |
| d3 | Taub Inst For Research On Alzheimers Disease |
| d4 | Microbiology |
| d5 | Joint Ctr for System |
| d6 | Center of Neurobiology and Behavior |
| d7 | Pathology |
| d8 | Pharmacology |
| d9 | Physiology and Cellular Biophysics |
| d10 | Irving Comp Cncr Ctr |
| | Irving Inst Clin/Tra |
| d11 | Dermatology |
| d12 | Medicine |
| | Medicine-Cardiology |
| | Medicine-Pharm/Exper Therap |
| d13 | Neurological Surgery |
| | Neurology |
| | Neurology-General Neurology |
| | Neurology-Merritt Center |
| | Sergievsky Center |
| d14 | Ophthalmology |
| d15 | Institute For Cancer Genetics |
| d16 | Pediatrics |
| d17 | Psychiatry |
| | Psychiatry-Epi Menta |
| d18 | Radiology |
| | Radiation Oncology |
| | Center For Radiological Research |
| d20 | Biostatistics |
| | MSPH BiostatisticsThompson |
| | Sociomedical Sciences |
| d21 | Center for Children's Environmental Health |
| | Environmental Health Sciences |
| d22 | Epidemiology |
| | Department of Health Policy and Management |
| d23 | MSPH - ICAP |
| d24 | MSPH Ctr Infection & |
| d25 | Dental Medicine |

| Code | Department Name |
|---|---|
| d26 | Ofc Of The Provost |
| | Theatre |
| | Art History and Archaeology |
| | East Asian Languages and Cultures |
| | English and Comparative Literature |
| | Germanic Languages |
| | Middle Eastern Languages and Cultures |
| | Music |
| | Philosophy |
| | Religion |
| | Ctr For Global Thoug |
| | Inst for Cmprtve Lit |
| | Inst Israel & Jewish |
| | East Asian Institute |
| | Middle East Institute |
| | Center for Iranian Studies |
| | Harriman Institute |
| | Cmtee Asia/Mid East |
| | Ctr Us-China Art Exc |
| | Inst for the Stdy Hu |
| | Rare Bk&Man Library |
| d27 | School of Journalism |
| | Anthropology |
| | Economics |
| | History |
| | Arts and Sciences (intrdept.) |
| | Center for International Conflict Resolution |
| | School of International and Public Affairs |
| | Inst Scl & Eco Rsrch |
| d28 | Biological Sciences |
| d29 | Chemistry |
| d30 | Physics |
| | Nevis Laboratories |
| | CU Radiation Labs |
| d31 | Psychology |
| d32 | Col Astrophysics Lab |
| d33 | Columbia Business School |
| d34 | SEAS-Ctr Comp Learni |
| d35 | APAM-Goddard Inst Sp |
| | Applied Physics and Applied Mathematics |
| d36 | Chemical Engineering |
| d37 | Civil Engineering and Engineering Mechanics |
| | Mechanical Engineering |
| d38 | Computer Science |
| d39 | Electrical Engineering |
| d40 | Earth and Environmental Engineering |
| d41 | Biomedical Engineering |
| d42 | Ctr Int Sci & Eng |
| d43 | School of Law |
| | Parker School of Foreign and Comparative Law |
| d44 | School of Social Work |

| Code | Department Name |
|---|---|
| d45 | IRI Climate & Societ |
| d46 | EI - Ctr Glbl Hlth & |
| | Earth Institute |
| | Ctr Env Res & Consrv |
| d47 | Ciesin |
| d48 | LDEO-Admin, Facil & |
| | LDEO-Biology Paleoen |
| | LDEO-Geochemistry |
| | LDEO-Marine Geology |
| | LDEO-Ocean & Climate |
| | LDEO-Office Marine O |
| | LDEO-Seismology/Geo/ |
| d49 | Ctr Climate Sys Rsch |
| d50 | Biomedical Informatics |
| d51 | Obstetrics and Gynecology |
| d52 | Otolaryngology |
| | School of Nursing |
| d54 | Heilbrunn Department of Population and Family Heal |
| | MSPH - PopAndFamilyHea |
| | MSPH Centers-NCCP |
| | MSPH - NCDP |
| d55 | Anesthesiology |
| d56 | Inst of Comparative Medicine |
| | Institute of Comparative Medicine |
| | Center of Medicine a |
| | Institute of Cancer Research |
| | Naomi Berrie Diab Ct |
| | The Center For Family Medicine |
| | Institute of Human Nutrition |
| | Rehabilitation Medicine |
| | Urology |
| d57 | Astronomy |
| | Ecology, Evolution and Environmental Biology |
| | Statistics |
| d58 | Orthopedic Surgery |
| | Surgery |

## Attachment 3: Promotion practices: Lamont Doherty Earth Institute (LDEO)[8]

LDEO research staff is divided into several different categories: Lamont Research Professors (LRPs) and Research Scientists (RSs).

The largest constituency is that of LRPs who initiate and pursue the core observatory research activity. They seek external support for their research, primarily from federal government grants. These grants support the scientific, educational, technical, and via ICR, the administrative activities of the observatory. Associate and Full LRPs participate in the governance of the Observatory through the senior staff assembly and by serving on various permanent and temporary committees. They are expected to regularly serve on national and international professional committees.

Research scientists generally enter the LRP line as Lamont Assistant Research Professor and move through the ranks of Lamont Associate Research Professor - Junior Staff, and Lamont Associate Research Professor - Senior Staff, to the top rank of Full Lamont Research Professor. LRPs could be hired into higher ranks based on their prior academic status. Acceptance of LRPs to the initial rank and promotions between ranks are all governed by well-defined set of policies and procedures, and overseen by the Observatory Promotions and Careers (P&C) Committee (constituting of LRPs of different ranks) and subject to the approval of the Observatory Research Staff of higher rank and the Executive Committee (ExCom) that is headed by the Lamont Director. Promotion to LRP senior staff is subject to a special, strict review process akin to the tenure process in the Officers of Instruction category, which includes solicitation of external letters of reference, the review of an appointment Ad-Hoc committee and the approval of the University Provost. LRPs are entitled to partial salary support from the observatory's endowment.

A smaller cadre of officers of research is that of the Observatory's Research Scientists (RSs). RSs support the Observatory's LRPs in their research and are covered solely by research grants and have no endowment support. RSs promotions from assistant to associate to senior ranks are also government by procedures (currently under revision) and by the oversight of the same P&C Committee, the Observatory research staff (of higher rank) and ExCom, with final approval of the Director. The P&C committee and ExCom also oversee the careers of all Observatory's postdoctoral scientist: the Institutional fellows and internal and external grant supported fellows.

Regarding salary equity: Starting research salary at LDEO is a matter of negotiation, with parity to others holding like positions. The final decision of salary is subject to a review and approval by the Lamont-Doherty Director. Broad consideration to salary equity is maintained in this stage as well as during promotions between ranks. The Observatory adheres to a process of annual performance review that applies to all administrative and research officers. One of the goals of this process is to insure salary equity. The decisions regarding annual salary increased for LRPs is based on a review of Activity Reports submitted by scientists to their division Associate Director and then reviewed by a committee of all Associate Directors and the Observatory Director and Deputy Director.

[8] Reference: http://www.ldeo.columbia.edu/about-ldeo/policies-procedures/appointments-promotions

## Attachment 4: Improving Negotiations

Prior research suggests that more clarity about job requirements, salaries, and promotion opportunities at the time of hiring are particularly useful for groups who are less effective negotiators. Babcock et al., focusing on women, suggest several steps managers can take in these circumstances. These include:

(1) Tell employees that they must ask for what they want and need;
(2) Inform employees about the benefits of negotiating;
(3) Recognize that different employees have different negotiating styles.

The committee encourages managers to follow these suggestions. It may also be useful for new employees to participate in negotiation training. Several schools at Columbia offer courses in negotiation:

- Masters program at the School of continuing education:
- Negotiation workshop @ Columbia Law School
- Managerial Negotiations @ Columbia Business School
- Seminar in Managerial Negotiations @ Columbia Business School

Outside resources may also be helpful:

*Resources for Women* – Suggested reading "**Women Don't Ask: The High Cost of Avoiding Negotiation-and Positive Strategies for Change**" by Linda Babcock and Sara Laschever, Bantam, 2007

*Resources for Asian* – Suggest that employees engage with Asian professional societies such as Ascend (http://www.ascendleadership.org), which offers negotiation workshops and leadership training.

*Resources for NRA* –The Committee suggests working with the International Student Office at Columbia to develop a workshop to raise awareness of developing negotiation and leadership skills.

*Other print resources useful for ALL*

Program on Negotiation, Harvard Law School (Harvard Negotiation Project), www.pon.harvard.edu (provides free reports on negotiation http://www.pon.harvard.edu/free-reports/)

Advanced leadership program for Asian American Executives, http://www.gsb.stanford.edu/exed/alp/