

University of Hawai i Faculty Pay Equity Study

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Prepared for

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Executive Summary

In April 2006, the University of Hawai‘i President’s Office and the University of Hawai‘i Professional Assembly jointly funded a system-wide Pay Equity Study of faculty salaries in

- Among UH M"noa temporary faculty, the data for the combined category of "Other Asian/Pacific Islanders/Samoan" faculty indicates that, on average, these faculty earn 7.3 percent less than their White counterparts. This initial finding requires additional review because the data only distinguishes between instructional and non-instructional temporary faculty, which does not address the market-based pay differences for researchers, and other non-instructional job classifications.
- There is no evidence of pay disparities by ethnicity at UH Hilo or UH West O'ahu.
- For the Community Colleges, the earnings of Korean and Hawaiian/Part Hawaiian faculty average 5.8 percent lower than their White counterparts.
- There are several important caveats to the study. The study was limited to a statistical review and therefore yielded general observations ("averages") based on large groupings of faculty by campus, related disciplines, or professional schools (e.g., "UH Hilo/UH West O'ahu," "UHM Medical/Law," and "UHM Other Research"). The need for statistically relevant groups of faculty meant that the analysis could not control for *departmental* differences in pay.
- It was also not feasible to incorporate individual merit and productivity into the data. It was assumed that on average, men and women and members of different ethnic groups are equally productive. Individual differences may exist at the department level and these would have to be analyzed using a case-by-case review of relevant peers or "similarly situated" comparators.
- The data does not control for "outliers" or faculty members who have substantially higher or lower salaries than their relevant peers. These statistically influential individuals would have to be reviewed on a case-by-case basis to determine if the differences in pay are due to legitimate factors such as high demand specialties or exceptional merit.
- The Faculty Pay Equity Study focuses on potential sex or ethnic disparities covered by the University's equal opportunity and affirmative action policies. These are compliance issues and have a higher institutional priority than other equity issues that may also be evident in the data. The study was not designed to address equity issues such as "compression," which refers to a tendency for new hires to negotiate more favorable starting salaries than their established colleagues, thus "compressing" the salary differential between new and senior faculty.

Recommendations

It is recommended that the President charge the Vice President for Community Colleges and the Chancellors of UH M^onoa and UH Hilo with taking the following actions:

- Review the list of tenure-track and temporary faculty members who have been identified by the Pay Equity Study as falling below the statistical benchmark. The reviews will be conducted by the Office of the Vice President for Community Colleges, the Office of the UH M^onoa Chancellor, and the UH Hilo Office of Human Resources, in consultation with their respective EEO/AA Directors.

These offices will update the August 2006 data with current information (e.g., individuals

1. INTRODUCTION

1.1 Background

This study seeks to determine whether there are significant wage differentials between the sexes and ethnic groups in the UH faculty that cannot be accounted for by differentials in qualifications, field or experience, i.e., that might result from some form of discrimination, conscious or otherwise. Previous studies have assessed UH faculty pay equity: one in 1993 for UH M^onoa, UH Hilo and UH West O^ʻahu, and the Community Colleges, and an update in 1998 for UH M^onoa.

A new study on UH faculty pay equity is warranted for at least three reasons. First, on most campuses, it has been over a decade since the last overall study was conducted and about one-half of our faculty have been hired since 1997. The previous studies do not include any of these new faculty members.

Second, previous studies did not encompass all faculty members. For example, they did not include temporary faculty and they focused on instructional faculty, although “manual” analyses of Specialists, Researchers and Extension Agents were conducted and adjustments implemented.

Third, there is need for a systematic and integrated approach to the study of pay equity within the UH system. Although all previous studies employed similar methods, ethnic groups were categorized differently, and different measures and specification were used to control for compensable factors. This new study differs from these studies in terms of data used, how ethnic groups are categorized, and how control variables are measured. And it also uses an integrated approach to allow direct cross-campus comparisons. Table 1 summarizes previous studies on pay equity at UH.

human resources database, such as date of hire, educational level, college, campus, job classification, tenure status, and faculty rank. Thus, the study seeks to determine whether significant differences in salary between male and female and among ethnicities remain after taking into account the compensable factors available.

2. METHODOLOGY

2.1 Multiple Regression Analysis

The statistical analysis employed in this study is a multiple regression analysis, which allows us to use multiple control variables (predictors/covariates) to predict an outcome with the estimated effects of each control on the outcome adjusted for the estimated effects of the other controls.

For this study, faculty salary is the outcome variable, and the controls are variables that potentially affect the outcome, including sex and ethnic group. The use of multiple regression allows us to examine whether a wage differential exists that might be attributed to discrimination but needs further review. Because other compensable factors such as experience, job classification, tenure status, employment unit, rank, and education are controlled, significant gender or ethnic differences in compensation suggest earnings differentials reflecting the non-compensable aspects of being female or belonging

indicate that there is an unexplained source of compensation differences among the groups under study controlling for “observed (included)” explanatory variables. Some people may believe that faculty productivity is different by ethnicity or sex, and therefore that the estimated coefficients are biased if we do not entirely control for productivity. Unfortunately, there is no feasible way of handling this issue given the data sets, and thus this potential issue is not addressed in the statistical analysis. Without having direct evidence to contrary, however, it is also far more reasonable to assume that there is no “on average” difference in productivity between male and female faculty and between White and other ethnic groups.

2.2 Data

The analysis in this study uses data from the Office of Human Resources (OHR) at the University of Hawai‘i. The data are taken from a “snapshot” of personnel records of the entire UH system as of August 2006—the most recent available when this study began. The August records were deemed to be the best choice because they reflect any change in faculty status and salary due to promotion or collective bargaining agreements, which usually are effective on August 1.

Pay for different job groups, for example, temporary faculty or non-instructional faculty, is often based on different qualifications or applicant pools and thus requires separate analysis. At least for UHM, it is possible to run separate regressions by tenure track status (i.e., faculty who are eligible for tenure or already tenured vs. faculty who are not eligible for tenure). Unfortunately, running separate regressions for different job classifications (researcher, specialist etc) is not feasible for non-instructional faculty because of the small number of observations. It is still possible to consider different effects of sex on

simultaneous impact on the outcome --faculty pay -- of more than one variable. Some technical issues involved in using interaction terms are discussed in Section 3. The data set was updated and cleaned, and constructed variables have been checked for errors and outliers using a standard statistical method. The final data set includes 2,318 faculty members at UH M"noa, 254 at UH

Ethnicity

Ethnicity is measured through a series of zero-one variables that take the value of one if the individual belongs to a particular ethnic group and that are otherwise zero. The White ethnic group is the reference group, i.e., all coefficients associated with other groups compare those groups' average pay with that of the White group. The original data identified 15 ethnic groups (Chinese, Japanese, Asian Indian, Hawaiian, Part-Hawaiian, Samoan, Black, Filipino, Korean, Mexican, Cuban, Puerto Rican, American Indian, Alaskan Native, Other Asian/Pacific Islander). Including variables for all of these groups in the analysis produced unreliable results, however, because of the small number of observations in some groups. Our exploratory regressions confirmed this problem.

For this reason, we combined the 15 ethnic groups into several larger groups. We paid careful attention to the grouping, because the results are sensitive to the grouping. We grouped some ethnicities together based on the number of observations—we tried to combine several small groups to form a larger one in order to increase the reliability of the statistical results—and according to the results of the exploratory regression analysis (the goal was to combine groups with similar results). Because they are relatively large groups, Japanese and Chinese were included as separately group in all regressions. Hawaiian and Part-Hawaiian were grouped together because their estimated results were similar in many of the exploratory regressions. Asian Indian and Pacific Islanders were added to the UHM regressions, because each group had significant results in the initial regressions. Similarly, Koreans were added to the regressions for the Community Colleges.

Employment Unit

Different fields are compensated differently in the private sector, and the university has to match these differences in compensation if they want to hire people from those fields. Thus employment unit is an important determinant of salary. We identified 13 employment units for UHM: Language and Literature, Humanities, Natural Sciences, Social Sciences, Education, School of Ocean and Earth Science and Technology (SOEST), College of Tropical Agriculture and Human Resources (CTAHR), Professional Schools (Medicine and Law), Business (including Travel Industry Management), Architecture and Engineering, Nursing and Social Work, Organized Research, and Other colleges.

This categorization is based on several criteria that are commonly used in analysis. Each unit should be representative (i.e., a sufficient number of faculty), have similar characteristics (e.g., professional schools such as med and law school), and share similar academic disciplines (e.g., same division and/or branch code). Language and Literature has the largest number of faculty members, and therefore we chose it as the reference group. The estimated coefficients of all the remaining colleges/departments in the regression are interpreted in reference to this base category.

All college units in UH Hilo and UH West O'ahu are grouped together, and we divide them into two groups only - UH at Hilo and UH West O'ahu. UH Hilo has a larger faculty than UH West O'ahu and thus it is selected as the base category.

Seven Community Colleges (CC) are included in the study: Honolulu CC, Kapi'olani CC, Leeward CC, Windward CC (including the Employment Training Center), Kaua'i CC, Maui CC, and Hawai'i CC. Kapi'olani CC is the base reference because it has the largest number of faculty members.

Rank

There are four ranks considered as explanatory variables: rank 2 through 5. Rank 2 was chosen as the reference group.²

Tenure Status

We include one dummy variable, taking the value of one if the person is not tenured, assuming that tenure status has an independent effect on earnings, net of the effect of rank on earnings.

Education

Ph.D. is the base category in the multivariate regression analysis. We include two dummy variables, professional degrees (M.D. and J.D) and the other degrees, which include the rest of the degrees such as M.A., B.S., and B.A.

Classification

Categories are important determinants of salary because different jobs within universities require different job qualifications. Both for UH M"noa and UH Hilo/UH West O'ahu, instructional faculty are the reference category used in the regression analysis. No categories are analyzed for Community Colleges, due to data insufficiency. For UH M"noa, four dummy variables are included for faculty who are tenured or eligible for tenure: Researcher, Librarian, Specialist, and County Agent. Because all county agents are either with SOEST or CTAHR, including all three dummy variables (SOEST, CTAHR, and County Agent) creates a statistical problem. To avoid this problem, we create the SOEST and CTAHR dummies in a way that does not include County Agents. For a similar reason, we do not create dummies for professional faculty (Law and Clinical). For UH Hilo/UH West O'ahu and temporary faculty at UH M"noa, we only include one dummy variable, non-instructional faculty, mainly due to data insufficiency.

Appointment

While we convert salaries for 11-month appointments to the 9-month equivalent annual salary based on a predetermined formula, the employment period (9 months vs. 11 months) is a part of current contract and/or individual characteristics that might affect annual salary. Thus, we

² If some portion of current rank is a result of selective or inequitable treatment due to institutional practice, then the estimated pay differential by sex or ethnicity is likely to be biased downward. The estimated measure excluding the rank variable could bias the true pay disparity as well, because it may not consider any legitimate factors originating

include a dummy variable that takes the value of one if the faculty member has an 11-month contract.

For similar reasons, we also include a dummy variable if the person's total FTE is not 100% with UH.

Year of Hire

This variable is represented by a series of dummy variables that take a value of one according to the year the faculty member was first hired. Those who were hired during the period 2001-2006 are the omitted category. This variable differs from the years at UH (experience) because the former controls the time effect on pay, while the latter measures the effect of work experience on earnings. Time effect could happen because economy,

There are some important issues for model specification. Although rank is a very important control variable affecting earnings, there are several issues about the variable. First of

category such as by classification, or by colleges. Thus use of these terms is approximately comparable to doing the analysis separately for the different groups involved in the interaction.⁴

Given these potential issues, we estimate several models to check the significance of variables in different models. The implications of results from different specification will be compared and explained in Section 4.

3. DESCRIPTIVE ANALYSIS

An Appendix Table (pg 30) presents descriptive analysis for University of Hawai'i at M^onoa (UHM), University of Hawai'i at Hilo and University of Hawai'i West O'ahu (UH Hilo and UH West O'ahu) and the Community Colleges. Of the 2,318 faculty members at UHM, 1,462 faculty (63%) received tenure or eligible for tenure, and 856 faculty (37%) are not eligible for tenure (temporary). Of the 1,462, 954 are females (41 percent). Female faculty are more likely to have temporary positions than are male faculty (43 vs. 33 percent).

Female faculty are also less likely to be White than are male faculty. Forty-eight percents of female faculty are White, while 64 percents of male are White. Japanese account for 11 percent for male faculty and 19 percent for female faculty, while Chinese account for 10 percent for male faculty and 9 percent for female faculty, suggesting that Japanese faculty are disproportionately more female. None of the other ethnic groups accounts for more than 4 percent of the faculty at UHM.

⁴ Including these terms requires enough variation in each group and thus large number of observations. In addition,

While the majority of female faculty are assistant professors (35%), the majority of male faculty are full professors (43%) at UHM. The dominance of assistant professor rank among female faculty is complemented by other evidence; the percentage of current faculty who joined UHM before 1991 is 42 percent for male faculty and only 24 percent for female faculty. Thirty-four percent of current male faculty joined UHM after 2001, while 43 percent of current female faculty joined after 2001. Female faculty are much more likely to be specialists and librarians than male faculty, while there are disproportionately more male faculty in the researcher category.

There are 254 faculty members at both University of Hawai'i at Hilo and University of Hawai'i West O'ahu; 110 are females (43 percent) and 144 (57 percent) are males. White faculty account for 76 percent of male faculty and 64 percent of female faculty, both of which are substantially higher than UHM. Japanese and Chinese form the next majority ethnic groups. For UH Hilo and West O'ahu, only 9 percent of male faculty are non-instructional faculty, compared with 17 percent for female faculty. Like UHM the largest number of male faculty are professors (41 percent), while female faculty are mor-7.7.1(cenTe.1(mtt101 Tw[0(pr)-7.1(of)-7.9u 9.469 0 T)

UH Hilo and UH West O‘ahu, female and male faculty respectively receive \$4,550 and \$5,180 per month on average. White and Korean faculty are the highest earners for UH Hilo and UH West O‘ahu. For the Community Colleges, female and male faculty respectively receive \$4,575 and \$4,674 per month on average. Interestingly, Asian Indians and Japanese faculty receive more than White faculty at the Community Colleges. Although these figures are informative, we cannot draw too many conclusions from the simple descriptive analysis. Thus we turn to regression results in the next section.

4. REGRESSION RESULTS

4.1. UH M"noa

Table 2 presents the results of multivariate regression analysis for UHM. We run the model separately for faculty who are eligible for tenure/tenured (Table 2-1) and for those who are not eligible for tenure (Table 2-2). This distinction is mainly due to the fact that their hiring and pay are based on quite different applicant pools. To check the significance of variables in different specifications, we also ran several regressions. Model 1 shows the estimated coefficients and their significance of all the controlled variables of the base model, which do not include any interaction terms, as described in section 2. Since the dependent variable is in natural log terms, the estimated coefficients are interpreted as an approximate percentage term. Table 2-1 reports results for faculty who are eligible for tenure/tenured. The results show that salaries received by female faculty are not lower than male faculty at any significance level. No significant results were found amongst ethnic groups, either. A test shows that ethnicity is not jointly (globally) significant either.

These results are in stark contrast with the findings from the 1993 study in which female faculty and Japanese descent were found to be underpaid. This might suggest that the problem of pay disparity by sex or ethnicity has been substantially improved since the last study.

Almost all college unit variables have a positive sign and are significant, suggesting that they receive higher earnings than the reference college unit (Languages, Linguistics and Literature) - a reminder that pay disparity due to market, discipline, and research area are not covered under “equity.” The results also suggest that faculty with professional degrees earn almost 18 percent $(0.162)^5$ more than those with doctorate

expected 16-25%. Additional findings indicate that faculty who achieved their final degree after being hired at UHM receive 2.7 percent lower earnings than their counterparts.

Models 2 through 4 present estimation results allowing interactions between variables. Again, it should be noted that the results should be interpreted with care, because the significance of the results may depend on the choice of the reference category of the interacted variables. That is, if a variable “x” is interacted with sex, then the significance of the interacted variable could depend on the choice of reference group for the variable “x”. Interactions are only made between employment units and sex and between job classification and sex. Although allowing interactions with ethnicity, such as between employment units and ethnicity, between classification and ethnicity, or between sex and ethnicity, is a potentially interesting specification, the results were not significant at all. This might be in large part due to the small number of observation in each ethnic group.

Model 2 presents the results allowing interaction between employment unit and female “dummy variable.” No interaction terms are significant at 5% significance level, which is the normal standard of reliability. Three groups, female faculty in SOEST, Other Research, and CTAHR are significant at more generous significance level, say 10% level or a little higher than 10%, suggesting that female faculty in these specific employment units tend to receive less than male faculty. To check whether the results are robust regardless of the base category, we re-estimated the model using other employment unit as an alternative base category. The estimated coefficients of the interaction terms for SOEST, Other Research, and CTAHR are often significant and negative, suggesting that these results are robust.

Model 3 shows estimation results including interactions between job classification and female. The interaction between researchers and female faculty are significant, suggesting that

differential by gender varies by job classification. The adjusted R-square was also highest (0.7863) with this specification, implying that the interaction terms have high explanatory power.

Finally, we estimate a separate model including two sets of interaction terms: one between employment unit and “female dummy” and the other between job classification and “female dummy.” The result (Model 4) shows that “female dummy” is not significant and interactions are not necessary. Furthermore, the adjusted R-squared is lower than Model 3 and same as that in Model 2. These results strongly indicate that allowing additional interactions are redundant. That is, the results from Model 3 (i.e., the significance of interaction between female faculty and researcher category) could be due to the high percentage of researcher faculty in a certain employment units: SOEST, CTAHR, or Other Research. Indeed, they have the highest percentage of researchers, accounting for more than 50 percent of all researchers at UHM. Thus,

highly significant, showing returns to experience of about 1 percent per year. This result suggests that time effects are not important for temporary workers. This might be related to the fact that market forces are more likely to be year-specific and a nationwide phenomenon. Paying faculty earnings comparable to other universities is important to recruit and hire regular faculty, but this is obviously not the case for hiring temporary faculty.

4.2. UH Hilo and UH West O‘ahu

Table 3 presents the results of multivariate regressions for UH Hilo and UH West O‘ahu. The models are similar to the case for UHM, in which Model 1 shows the estimated results for the baseline model, and Models 2 through 4 show results with interactions. Results for UH Hilo and UH West O‘ahu are quite different from those for UHM. To summarize the results, while the female variable is not individually significant in all specifications, its interaction with the non-instructional variable is significant at the 5% level. Results generally indicate that non-instructional female faculty receive earnings that average 13 percent lower than their counterparts. However, there is no evidence that there is a gender pay differential among instructional faculty. There is also no evidence that UH Hilo is different from UH West O‘ahu in terms of pay. Nor did we find evidence of pay disparity by ethnicity for the UH Hilo and UH West O‘ahu sub-sample.

4.3. Community Colleges

We found an earnings differential between the sexes and ethnicity in the Community Colleges. These results can be gleaned from Table 4, which shows estimated coefficients of controlled variables and their significance. Again, the models are similar to the case of UHM, in which Model 1 shows the estimated results for the baseline model, and Model 2 shows results with

interactions. However, most faculty in community

Table 2-1. Estimation Results for UHM (Eligible for Tenure or Tenured)

Model 1 Model 2

Appointment				
11-Month	0.015	0.014	0.015	0.013
Not 100% FTE	0.003	0.014	0.004	0.002
Not tenured	-0.022	0.001	-0.022	-0.020
Education				
Professional degree	0.162***	0.161***	0.160***	0.160***
Other than Ph.D.	-0.047***	0.047***	-0.049***	-0.049***
Job Classification				
Librarian	-0.159***	0.160***	-0.136***	-0.139***
Researcher	-0.018	-0.018	-0.010	-0.020
Specialist	-0.107***	0.106***	-0.127***	-0.131***
County Agent	-0.174***	0.160***	-0.176***	-0.168***
Date of Hire				
Before 1970	-0.078	-0.087	-0.101	-0.096
1971-75	-0.123	-0.130	-0.142**	-0.138
1976-80	-0.102	-0.110	-0.120**	-0.117
1981-85	-0.117**	-0.123**	-0.130***	-0.128***
1986-90	-0.096***	0.099***	-0.103***	-0.102***
1991-95	-0.082***	0.084***	-0.088***	-0.086***
1996-00	-0.051***	0.053***	-0.055***	-0.054***
Experience				
Experience at UH	0.003	0.003	0.004	0.004
Hired before degree	-0.027**	-0.027**	-0.025	-0.026
Experience missing	-0.011	-0.009	-0.008	-0.006
Rank				
Rank 3	0.138***	0.145***	0.143***	0.148***
Rank 4	0.285***	0.291***	0.288***	0.293***
Rank 5	0.516***	0.522***	0.519***	0.525***
Adjusted R-squared	0.7858	0.7856	0.7863	0.7856
Number of observation	1,462	1,462	1,462	1,462
1) Excluding County Agents				
** and *** denote significance at 5 and 1 percent level respectively.				

Table 2-2. Estimation Results for UHM (Not Eligible for Tenure)

	Model 1	Model 2	Model 3	Model 4
	No Interaction between variables	Unit & Female	Classification & Female	Unit & Classification & Female
Sex				
Female	-0.014	0.010	-0.030	-0.014
Ethnicity				
Chinese	0.006	0.006	0.007	0.007
Asian Indian	-0.036	-0.035	-0.036	-0.035
Japanese	-0.022	-0.023	-0.022	-0.023
All/Part Hawaiian	0.027	0.024	0.026	0.024
Pacific/Samoan	-0.070**	-0.066**	-0.070**	-0.067**
Other Ethnicities	-0.003	-0.003	-0.002	0.001
Interactions				
Humanity*Female		-0.005		0.006
Natural				
Science*Female				

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Appointment				
11-Month	-0.182***	0.181***	-0.182***	-0.180***
Not 100% FTE	0.005	0.005	0.006	0.004
Education				
Professional degree	0.281***	0.280***	0.281***	0.278***
Other than Ph.D.	-0.006	-0.010	-0.006	-0.010
Job Classification				
Non-instructional	0.052**	0.054**	0.041	0.014
Date of Hire				
Before 1970	-0.276	-0.270	-0.272	-0.253
1971-75	-0.142	-0.133	-0.141	-0.125
1976-80	-0.216	-0.214	-0.213	-0.202
1981-85	-0.171	-0.169	-0.170	-0.165
1986-90	-0.074	-0.072	-0.074	-0.069
1991-95	-0.043	-0.041	-0.04	-0.04

Table 3. Estimation Results for UH Hilo and West Oahu

Model 1

Model 2

Model 3

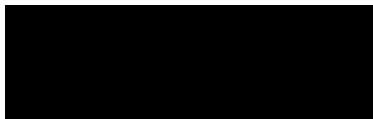
Rank		
Rank 3	0.080***	0.080***
Rank 4	0.152***	0.154***
Rank 5	0.257***	0.258***
Adjusted R-squared	0.7668	0.7692
Number of observation	916	916
** and *** denote significance at 5 and 1 percent level, respectively.		

	(0.22)	(0.21)	(0.22)
Samoan	3	5	8
	(0.22)	(0.52)	(0.35)
Unknown	11	10	21
	(0.8)	(1.04)	(0.91)
White	875	459	1,334

Monthly earnings	Obs	Mean	Std. Dev.	Min	Max
Male	1,364	6,815	2,351	2,564	19,839
Female	954	5,407	1,837	2,513	16,079

B. Hilo & West Oahu			
Ethnicity	Male	Female	Total
American Indian/Alaskan	2	0	2
	(1.39)	(0)	(0.79)
Black	3	2	5
	(2.08)	(1.82)	(1.97)
Chinese	9	4	13

Ethnicity	Male	Female	Total
American Indian/Alaskan	1	4	5
	(0.24)	(0.81)	(0.55)
Black	3	1	4
	(0.71)	(0.20)	(0.44)
Chinese	17	43	60
	(4.02)	(8.72)	(6.55)
Filipino	21	25	46
	(4.96)	(5.07)	(5.02)
Portuguese	3	1	4
	(0.71)	(0.20)	(0.44)



Earnings	Obs	Mean	Std. Dev.	Min	Max
Male	423	4,790	919	3,035	7,719
Female	493	4,575	863	3,220	7,563
American Indian/Alaskan	5	4,574	803	4,016	5,914
Black	4	4,301	427	3,740	4,731
Chinese	60	4,813	828	3,439	6,835
Filipino	46	4,566	880	3,347	6,756
Portuguese	4	4,687	843	3,639	5,449
Hawaiian	16	3,771	411	3,347	4,542
Asian Indian	7	5,067	1,164	4,063	7,245
Japanese	237	4,818	890	3,220	7,719
Korean	12	4,714	963	3,506	6,333
Mexican/Cuban	7	3,796	551		