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Minjeong Seok April 12, 2022

Measuring Calibrated Diversity Index

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Abstract

Measuring Calibrated Diversity Index
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This study evaluates how the true diversity of the student, faculty, and entire Emory community, according to the sample, is in the perspective of the individuals. The data for this study was acquired from a survey that was composed with the participants' self-report of their demographic attributes– gender, sexual orientation, race/ethnicity, political view, and their socioeconomic status– and their personal rating of importance of each attribute into the notion of diversity. With the data sample, this study utilized the Simpson's Diversity Index and modified it in a way to get the result of the probability that two individuals randomly selected from a population are different and with the calibration factor– relative weight values– that represent individuals' own definition of diversity.

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Introduction

What is Diversity

Diversity within a population remains a pressing issue for all communities– including workforce and educational settings. "Diversity" stated here defines the population's composition of individuals with varying attributes. But, what features are we referring to? All individuals hold unique qualities. Today, the variation could be based on gender, sexual orientation, race/ethnicity, political view, socioeconomic status, age, religion, language, health capabilities, academic/professional background, and other attributes within the wide range of interests, background, and experience (Arce-Trigatti, 2020; (“Define_diversity.Pdf”; Lieberson 1969; Solanas).

For example, if there were a room with four people, of whom 2 are men and 2 are women, this room would be considered diverse. But what if all of them are the same race? Is this room still regarded as diverse? How will the portrayal change if they vary in both gender and race, but all four individuals are categorized under the same income level? Would we label this group to be still diverse? The concluding idea is that due to the myriad of features "diversity" holds; it is complex to know up to what extent the term "diversity" covers. Therefore, this study will explore how diverse the Emory community is with multiple attributes and relative importance weights

Diversity's lack of a universally accepted definition makes it a complex concept. The notion of diversity is malleable: it morphs according to the society it attempts to describe, and this for instance, is observable through the United States Census Bureau's questionnaire.

Both the 1960 and 2020 Census asked the same questions regarding an individual's demographic attributes: sex, age, and race/ethnicity. Still, the difference between the two societies of different times is stark in the race/ethnicity question. The 1960 Census asks for the individual's race/ethnicity by including 11 choices: "White, Negro, American Indian, Japanese, Chinese, Filipino, Hawaiian, Park Hawaiian, Aleut, Eskimo, etc" (“1960censusquestionnaire-2.Pdf”; “1960 (Population) - History - U.S. Census Bureau”). In comparison, the 2020 Census asked two questions for race and ethnicity (one about Hispanic origin and one about race). For the question of Hispanic origin, the Census asks, "Is a person of Hispanic, Latino, or Spanish origin," and it includes the specification for the response choices "Mexican, Mexican Am., Chicano, Puerto Rican, Cuban" or others. The options under the question regarding race/ethnicity are also comprehensive. The 2020 Census allows individuals to specify their race/ethnicity if not given as one of the choices and provide all that applies, compared to the 1960 Census, which used an umbrella term, "etc" (“2020 - History - U.S. Census Bureau”).

Today, diversity incorporates an extensive collection of attributes compared to decades ago in the United States of America. In the 1960s, the main features were Race/Ethnicity, religion, and political preference (Lieberson, 1969). The change in society's ideology and demographics has

led to the United States population being more diverse and multicultural than in the past. The perception of diversity has broadened in keeping with the times.

The diversity– human population diversity– delineated above is only a single dimension within a broader idea. Human diversity is categorized under the sociology field, where it defines the aspect of diversity to be a characteristic– physical, mental, and background– of the individual. The study of economics also uses the term diversity to underline the financial status and information for the industries' employees: employment status, income inequality, risk, and uncertainty, measures of competitiveness of a market, and monopoly power. Another field diversity is commonly seen is for political use. The concept of diversity assists in measuring political competitiveness: parties represent the types and percentages of each party for the vote. Lastly, ecology also significantly relies on diversity indices for it measures species diversity. The purpose of diversity indices in ecology is to summarize the species' richness and abundance and the variety of resources that species use and need. Of the many diversity indices, the Shannon-Weaver index is one of ecology's most prevalent measurement indices (Tramer, 1969). The Shannon-Weaver index equation showcases the ratio of the species' observed diversity with the species' proportion of individuals. The complexity of diversity stems from its potential to differ through society and study fields.

What is a Diversity Index

Past studies have researched ways to measure the extensive topic of diversity as a single numerical measurement: diversity indices. A myriad of different diversity indices exists and are in use. All the diversity indexes seek to measure the magnitude of diversity within and between multiple population characteristics mathematically. A standard approach is to find the probability of randomly selecting two samples to be different with permutation and/or combination. Vector form is also used when working with multiple attributes. For example, if there were three attributes, those aspects would be recorded as a vector (x, y, z). In a vector-form, these attributes would be assigned different weights according to the homogeneity and heterogeneity of the attributes when applied to the diversity indexes, which target the cross classifications (Rushton, 2008). This aligns with the method of measuring a multidimensional diversity index.

There are other multiple ways that the heterogeneity of a sample could be measured; one which is Simpson's Diversity Index. The Simpson's Diversity index is notable in the field of ecology, biology, and human population diversity. The index showcases the numbers of ways two randomly selected samples are the same divided by the total ways any two samples could be randomly selected. In summary, this index calculates diversity through the measurement of the probability that two individuals randomly selected from a population are the same. When the equation is unraveled, it could be seen that this index is calculated with the mathematical notation of *combination*. The concept is like randomly drawing names from a bowl. The selection holds no importance in order, and there is no repetition.

For this research, I took the Simpson's Diversity Index and modified it in a way to get the result of the probability that two individuals randomly selected from a population are different and took into consideration individuals' own definition of diversity. This will be further discussed in this paper.

Novelty of Research

The focus community of this paper is the Emory University community. With the modified Simpson's Diversity Index formulated for this research, it did not only measure the diversity of the Emory University community according to the demographics data, but also found the diversity of Emory's community in the perspective of individuals. This was done by incorporating the individual's weight of importance on each attribute.

In this paper, I will use the term *attribute* to indicate categories of diversity features (*Gender*, *Sexual Orientation*, *Race/Ethnicity*, *Political View*, and *Socioeconomic* status) and *types* to label those belonging under the attributes- for example, men, women, other.

To represent a diversity index including the 5 attributes of diversity, the Simpson's Diversity Index was primarily modified to be multidimensional and delineate the different definitions each individual (or group) has of diversity.

The secondary modification to the Simpson's Diversity Index was the inclusion of relative importance weights, which were based on observed data. When working with the magnitude of diversity within and between multiple social aggregates, not all types categorized under the attributes of diversity are viewed and weighed the same when it comes to importance. These different weights could stem from each individual's different social identities and backgrounds. For instance, suppose an individual gives an importance weight of 3 for *Gender*, 2 for *Sexual Orientation*, 5 for *Race/Ethnicity*, 1 for *Political View,* and 4 for *Socioeconomic*. Then, that person would be said to give $\frac{4}{15}$ for their *Socioeconomic* weight.

The modifications to the model stated above assists to satisfy the purpose of the paper: to find the true diversity of the student, faculty, and entire Emory community, according to the sample, is in the perspective of the individuals.

This concept is applied into the model of Simpson’s Diversity Index with the relative importance weights.

Methodology

Data Collection

This study was constructed to focus on the Emory University community. Therefore, the sample for this study only consisted of Emory students (undergraduate and graduate) and Emory faculty, staff, and administrators, excluding individuals who have not attained the legal age for consent to treatments.

All participants were recruited through direct emails, public chat platforms, ListServ emails, and written announcements through their course Canvas platform. As this survey was administered through an online format, before starting the survey, all the participants were provided with a written *Informed Consent*, which included the description of the research, what participants are asked to do, possible risk, compensation, approximate time commitment, and steps for revoking their authorization. Contact information of the principal investigator and the co-investigator was also included for those who had any questions about the study, their part in it, their rights as a participant, or any concerns/complaints about the research.

Survey Description

The survey was composed of two main parts. The first part asked the participants to self-report their demographics, which are the attributes used in this study: *Title*, *Gender*, *Sexual Orientation*, *Racial/Ethnic Identity*, *Political View*, and *Socioeconomic* status. Following this, the latter part asked the participants to provide their rating 1 (Strongly Disagree) - 5 (Strongly Agree) for each attribute to the question "_____ is an important attribute for diversity."

The categories under *Race/Ethnicity* that indicate what the participant reports to classify were derived from the 2020 United States Census Informational Questionnaire ("2020-Informational-Questionnaire-English").

The *Socioeconomic* section's choices indicate 3 income groups: low income, middle income, and upper income, and these income ranges were based on Pew Research's data (Snider). The low-income group includes the income less than $52,200– less than two-thirds the national median. The middle-income group includes the income range $52,200 to $156,600– range between two-thirds to double the national median. The upper income group includes the income more than $156,600– more than double the national median.

The survey was anonymous, and precautions were taken to protect participants' privacy, which includes not asking the participants to provide their personal information (name, age, phone number, or email address). This was done with a purpose to acquire a truthful report from all the participants to lower chances of the data to be hypothetical.

Participants were not asked for any personal information; however, those who wished to be considered in the raffle for compensation were asked to answer this optional question of providing their Emory email address. This was stated in the *Informed Consent* number 6, see on *Figure 2*. At the end of the survey, an optional question was asked for compensation. The participants who provided their Emory email addresses were consented to participate in the random selection for receiving a $10 Gift Card. The raffle process randomly selected thirty (30) participants who participated in the optional section. See, *Figure 1 - 6* for the survey participants took.

Descriptive Statistics

For the descriptive statistics, graphs have been made to depict the proportion of the attributes the sample size consisted of. See *Graph 3, Graph 6, Graph 10, Graph 13, Graph 14, Table 11 - 16* for sample description statistics.

To compare the sample descriptive statistics to the actual Emory University demographic of the proportion of the attributes– *Title, Gender,* and *Race/Ethnicity*– see *Graph 4-5, Graph 7-8, Graph 11-12* for the proportion of actual Emory University attribute proportion and comparison of the frequency of individuals under the types of the attributes *Title, Gender,* and *Race/Ethnicity.*

From the comparisons, it was showcased that for the attributes *Title* and *Gender* the types student and women were overly represented in the sample, and the remaining types were under-represented. Additionally, for the attribute *Race/Ethnicity*, the types Black or African American and White under-represented, and Asian, Hispanic, Latino, or Spanish, and Two or More Race types were overly represented.

Empirical Methods

A. Equation

The model used for this study is centralized around an existing measurement of diversity index called the Simpson's Diversity index. See *Equation 1* for the Simpson's Diversity Index equation (Simpson, 1949). Simpson's Diversity index measures the probability that two randomly selected individuals from the subgroup are the same type. The variable *n* will represent the number of individuals with the particular trait *k*, and *N* indicates the total number of individuals in the subgroup. Simpson's Diversity Index DI_k for attribute *k* depends on the number of types T_k within that attribute, the number of people of that type n_i for $i = 1 \ldots T_k$, and the total population N:

$$DI_k = \sum_{i=1}^{T_k} \left(\frac{n_i}{N}\right) \left(\frac{(n_i - 1)}{(N - 1)}\right)$$

Equation 1: Simpson's Diversity Index

The purpose of the diversity index was to indicate the probability that two randomly selected individuals from the subgroup were different. Therefore, the equation used to measure each attribute's diversity index was 1 subtracted by *Equation 1*, which is labeled as DI_j where *j* is each attribute. See *Equation 2* for DI_j equation. The overall *DI* variable was the summation of all the DI_j with the calibrating variables, which will be further explained below.

$$DI_j = 1 - \sum_{i=1}^{T_k} \left(\frac{n_i}{N}\right) \left(\frac{(n_i - 1)}{(N - 1)}\right)$$

Equation 2: Equation of DI_j

Upon the Simpson's Diversity Index, this research includes calibration of this equation according to the individual's weighted value on each attribute. This calibrating variable will be labeled as

the Relative Importance factor (α). Unlike the *DI* variable, this variable will be unique about all the subgroup's diversity index measurements. Alpha (α) is calculated by dividing the summation of rating for an attribute- *Gender*, *Sexual Orientation*, *Race/Ethnicity*, *Political View*, or *Socioeconomic*- by the total sum. These alpha values depict the proportion of the participants' weight of its importance in the definition of "diversity". Therefore, the summation of the alpha values equal 1. The relative weight value for any attribute depends on the weight of each attribute, expressed as *w*, within the subgroup it is representing the *J* population:

$$\alpha_g = \frac{\sum_{x=1}^{X} (w_g)}{(w_g + w_s + w_r + w_p + w_{se})}$$

Equation 3: Equation of α_g

This value depicts the weight of importance of the attribute of the subgroup, and I will focus heavily on this variable for this study.

$$CDI = \alpha_g DI_g + \alpha_s DI_s + \alpha_r DI_r + \alpha_p DI_+ \alpha_{se} DI_{se}$$

Equation 4: Calibrated Diversity Index Equation

The relative importance weights will be applied to the Diversity Indices to formulate a *Calibrated Diversity Index* equation (see *Equation 3*). The Calibrated Diversity Index is then a linear combination of the diversity index for each attribute, weighted by the relative importance weights α_g, α_s, α_r, α_p, α_{se} (for *Gender, Sexual Orientation, Race/Ethnicity*, *Political View,* and *Socioeconomic*, respectively).

B. Data Analysis

The diversity indexes were found for the different titles– student and faculty, staff, administrators–and the entire participants. There are 15 diversity index variables: 5 attributes for each. These same diversity indexes were applied to measure each group according to the relative importance weights of each subgroup assigned.

All data analyses were conducted with RStudio Version 1.3.1056 and Microsoft Excel Version 16.29. First separate subsets were made for all the data observed. Then, all the alpha values and the diversity indices were found through inputting each subsets' numerical variables into the equations listed in *A. Equation*. Later to observe the trends of the subsets' alpha values, bar graphs for proportion were made. See *Table 11-26* and *Graph 15-90* in the Appendix for the descriptive statistics of all subsets and the observed measures.

Results

Prior to observing the differing alpha values and diversity indices, it is significant to note the different sample sizes for each subset.

The sample sizes ranged from 2 to 200s. Regarding the awareness of the lack of significance of the data analysis due to lacking sample size, all subsets were considered in this study. The purpose of this study was to analyze many but not all the varying subsets, including combinations of attributes, and highlight the diversity the Emory community holds. Therefore, it is important to note all subsets that have been analyzed.

Subgroups

This study includes 76 subgroups: by attribute, attribute simplified, and combinations.

	TITLE		GENDER		SEXUAL ORIENTATION		RACE		POLITICAL VIEW		SOCIO-ECONOMIC
1	Student	1	Man	1	Heterosexual	1	American Indian or Alaska Native	1	1: Progressive (Left-Leaning)	1	Lower: Less than $52 200
2	Faculty, Staff, Administrator	2	Woman	2	Bisexual	2	Asian	2	2	2	Middle: $52 200 to $156 000
3	All	3	Other (Gender)	3	Homosexual	3	Black/African American	3	3: Centrist	3	Upper: More than $156 000
				4	Other (Sexual Orientation)	4	Hispanic, Latino, or Spanish origin	4	4		
						5	White	5	5: Conservative (Right-Leaning)		
						6	Other (Race)	6	Conservative (4+5)		
						7	Two or More Races				

Table 1: List of Attribute Subgroups

	RACE (simplified)		SEXUAL ORIENTATION (simplified)
1	Majority	**1**	LGBTQ+
2	Minority	**2**	Non-LGBTQ+

Table 2: List of Attribute Simplified Subgroups

	GENDER & RACE		RACE & POLITICAL VIEW		GENDER & POLITICAL VIEW		RACE & SEXUAL ORIENTATION
1	Asian Men	**1**	Majority Progressive	**1**	Men Progressive	**1**	Majority Non-LGBTQ+
2	Asian Women	**2**	Majority Centrist	**2**	Men Centrist	**2**	Majority LGBTQ+
3	Black/African American Men	**3**	Majority Conservative	**3**	Men Conservative	**3**	Minority Non-LGBTQ+
4	Black/African American Women	**4**	Minority Progressive	**4**	Women Progressive	**4**	Minority LGBTQ+
5	White Men	**5**	Minority Centrist	**5**	Women Centrist		
6	White Women	**6**	Minority Conservative	**6**	Women Conservative		
7	Minority Men						
8	Minority Women						

Table 3: List of Combination Subgroups

	TITLE & SOCIOECONOMIC		SEXUAL ORIENTATION & SOCIOECONOMIC		TITLE & POLITICAL VIEW		RACE & SEXUAL ORIENTATION & GENDER
1	Student Lower	1	Non-LGBTQ+ Lower	1	Student Progressive	1	Asian Non-LGBTQ+ Women
2	Student Middle	2	Non-LGBTQ+ Middle	2	Student Centrist	2	Asian Non-LGBTQ+ Men
3	Student Upper	3	Non-LGBTQ+ Upper	3	Student Conservative	3	Black/African American LGBTQ+ Women
4	Faculty/Staff/ Administrator Lower	4	LGBTQ+ Lower			4	Black/African American LGBTQ+ Men
5	Faculty/Staff/ Administrator Middle	5	LGBTQ+ Middle			5	Black/African American Non-LGBTQ+ Men
6	Faculty/Staff/ Administrator Upper	6	LGBTQ+ Upper			6	White Non-LGBTQ+ Men
						7	White LGBTQ+ Women

Table 4: List of Combination Subgroups Cont.

For the Combination category, of the many that are possible to analyze, the specific eight subgroups listed above were chosen for this study.

Primary Analysis

A. Diversity of Emory University's Population

Before analyzing each subset's diversity indices, the diversity of Emory's student, faculty/staff/administrator, and entire sample from the population demographics was derived.

	DI_g	DI_s	DI_r	DI_p	DI_{se}
Student	0.4621	0.4054	0.6765	0.6766	0.6346
Faculty, Staff, Administrator	0.3248	0.3692	0.4918	0.7210	0.5061
All	0.4287	0.3949	0.6701	0.6960	0.6084

Table 5: Diversity of Emory University's Student, Faculty, and Entire Population (survey data)

These variables were found with the use of *Equation 1*. The numerical result portrays the probability that two individuals randomly chosen will be different. Therefore, the result of this measurement ranges from 0-1: 0 indicating that it is not diverse and 1 indicating that it is diverse. In all the attributes, but *Political View*, the Student population is more diverse than the Faculty, Staff, and Administrator population.

With this data result, the measurements from this analysis were further applied to each subset to observe the subsets' perspective of how diverse each population group (Student, Faculty, and All) is.

The calibrated diversity index was then found for these three groups (Student, Faculty, and All) with the relative weight values and diversity indices. See *Table 11* for the *Title*'s alpha values and diversity indices.

Secondary Analyses

A. Diversity Indices

Overall, the diversity indices found to show how each subset reflect the diversity of Emory community according to the diversity of Emory's student, faculty/staff/administrator, and entire population, showcased no observable difference. See *Table 11 - 26* to observe the different $\mathrm{DI}_{\mathrm{student}}$, $DI_{faculty}$, and DI_{all} for all subsets used in this study.

	Man	Woman	Other (Gender)	Heterosexual	Bisexual	Homosexual	Other (Sexual Orientation)
$DI_{student}$	0.5729	0.5702	0.5597	0.5719	0.5677	0.5672	0.5631
$DI_{faculty}$	0.4770	0.4752	0.4561	0.4769	0.4718	0.4702	0.4625
DI_{all}	0.5603	0.5577	0.5449	0.5595	0.5548	0.5540	0.5491

Table 6: Diversity Indices (Student, Faculty, and All) for Gender and Sexual Orientation

Similar to the description listed for *Title* under **Primary Analysis**, the same process was done for subgroups separated by *Gender* and *Sexual Orientation*. As shown in *Table 6*, the two attributes' subgroups' diversity indices did not show a drastic difference within the population divided by *Title*.

B. Relative Weight Values

The *Equation 3* is applied to all subgroups to find each subgroup's unique relative weight values for each attribute.

The result of the relative weight values observed to be similar for most subgroups. Due to this, the diversity indices within the calibrated diversity indices applied into *Title* types were also similar. See *Table 11-26* to observe all the relative weight values for all subsets.

	α_g	α_s	α_r	α_p	α_{se}
Man	0.2120	0.1822	0.2210	0.1743	0.2104
Woman	0.2095	0.1947	0.2188	0.1716	0.2055
Other (Gender)	0.2147	0.2260	0.2260	0.1073	0.2260
Heterosexual	0.2098	0.1881	0.2199	0.1758	0.2064
Bisexual	0.2104	0.2030	0.2178	0.1615	0.2074
Homosexual	0.2135	0.2018	0.2174	0.1563	0.2109
Other (Sexual Orientation)	0.2125	0.2167	0.2250	0.1292	0.2167

Table 7: Alpha Values for Gender and Sexual Orientation

However, there were few subgroups that had evidently differing relative weight values. But the results of the calibrated diversity indices were the same result as those with similar relative weight values: they were similar within the type of calibrated diversity indices.

SEXUAL ORIENTATION	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Heterosexual	346	76.21%	0.2098	0.1881	0.2199	0.1758	0.2064	0.5719	0.4769	0.5595
Bisexual	62	13.66%	0.2104	0.2030	0.2178	0.1615	0.2074	0.5677	0.4718	0.5548
Homosexual	35	7.71%	0.2135	0.2018	0.2174	0.1563	0.2109	0.5672	0.4702	0.5540
Other	11	2.42%	0.2125	0.2167	0.2250	0.1292	0.2167	0.5631	0.4625	0.5491

Table 8: Alpha Values and Diversity Indices (Student, Faculty, and All) for Sexual Orientation

The alpha values for the *Sexual Orientation* attribute the relative weight varies by more than 0.04 (1 and 5). However, the diversity indices within the *Title* types' (Student, Faculty, and All) calibrated diversity indices do not portray a difference.

C. Statistical Testing

Furthermore, there was significant testing done to see if this is no significant difference of average relative weight values.

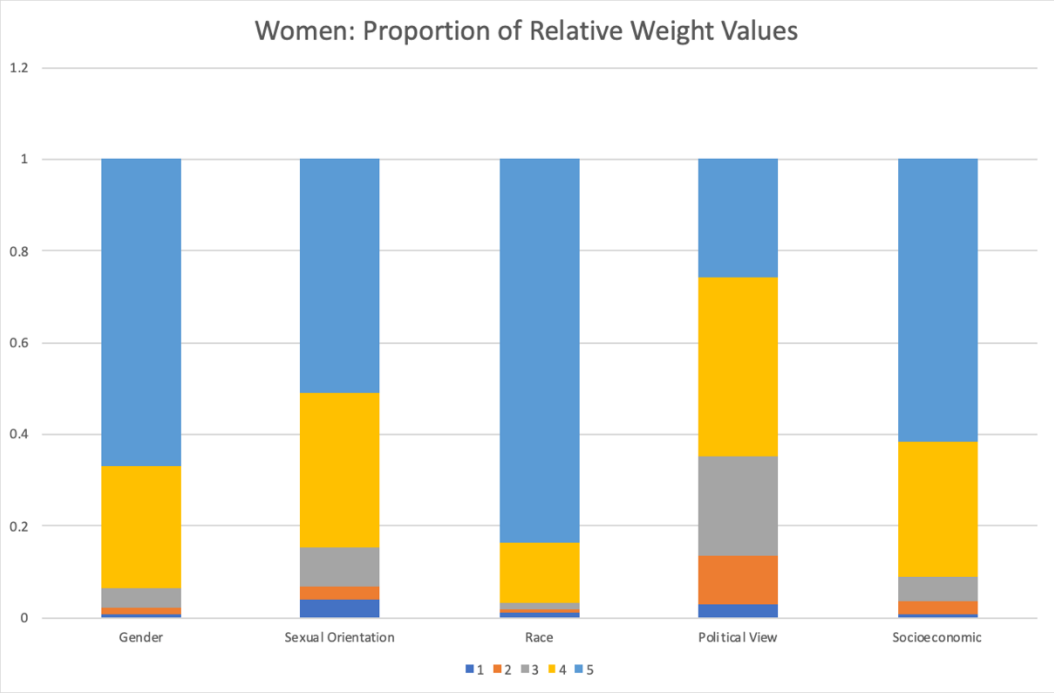
The types– student and faculty, staff, administrator– under the attribute *Title* only had a significant difference in the average relative weight value for the attribute *Political View*, with the decision of 10% risk ($p = 0.08189$). *Gender* ($p = 0.3252$), *Sexual Orientation* ($p = 0.1655$), *Race/Ethnicity* ($p = 0.157$), and *Socioeconomic* ($p = 0.2293$) did not prove that there is no significant difference of the average relative weight value. In summary, there is a statistically

significant difference between how student compared to the faculty regard *Political View* as a valid measure of diversity.

D. Trend of Relative Weight Proportions

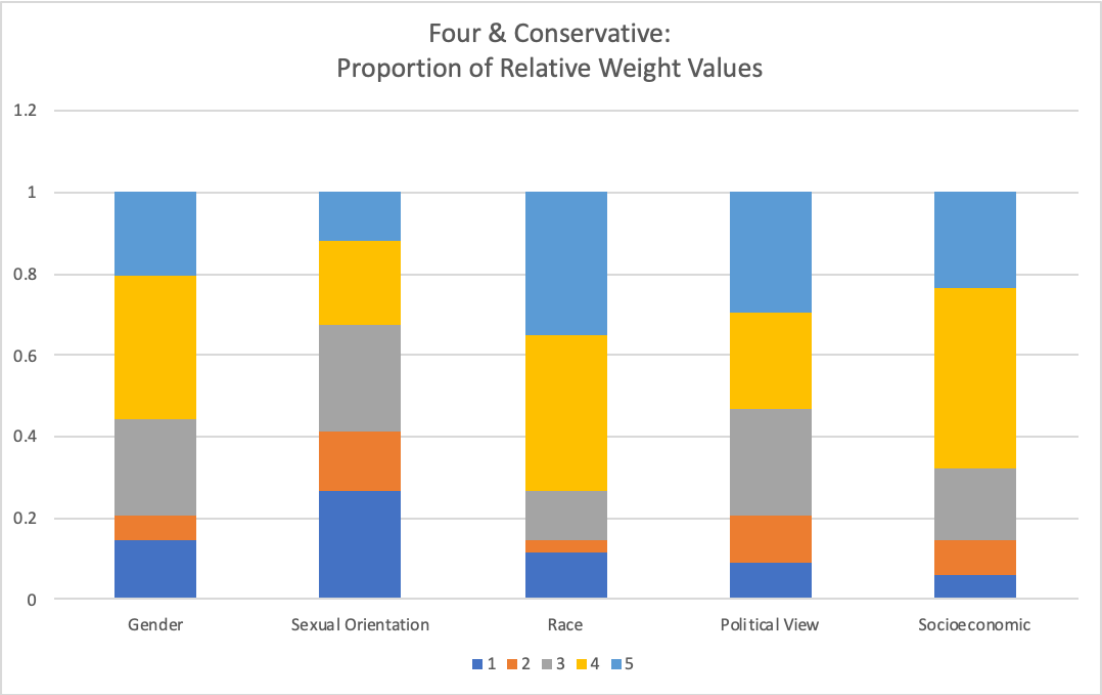
Due to the no evident difference between relative weight values and/or diversity indices from the alpha values, graphs were plotted to showcase the proportions of participants' rating of 1 (Strongly Disagree) - 5 (Strongly Agree). This was used to explore a trend of the personal rating of importance of each attribute into the notion of diversity.

From this, it was found that the ranking of the importance weights was not generally different. For most, the order was Race/Ethnicity being most important, then followed by gender of socioeconomic, then sexual orientation, and political view for last. This was observed by measuring the proportions of higher rankings assigned for the attributes.



Graph 1: Women: Proportion of Relative Weight Values

Additionally, there were some subgroups that did not have the general order (*Race/Ethnicity*, *Gender* or *Socioeconomic*, *Sexual Orientation*, and *Political View*). But the subgroups without this order all had the similarity that political view was NOT ranked last. The subgroups that did not rank the *Political View* attribute weight last include Political View 4, Political View 5, Conservative (4+5), Black/African American Men, Black/African American Non-LGBTQ+ Men, White Non-LGBTQ+ Men, Race Majority Conservative (4+5), Race Minority Conservative (4+5), Conservative (4+5) Women, Conservative (4+5) Men, and Conservative Student (4+5). These subgroups have in common: they are either Conservative (4+5) or Men.



Graph 2: Conservative (4 + 5): Proportion of Relative Weight Values

There were trends within the subgroups as well. For the *Sexual Orientation (simplified)* subgroup, it is observed that the relative weight for *Sexual Orientation* is higher for the LGBTQ+ group compared to non-LGBTQ+. Additionally, the *Political View* is higher for the non-LGBTQ+ group compared to LGBTQ+.

LGBTQ+ vs. non-LGBTQ+	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
LGBTQ+	108	23.79%	0.2116	0.2040	0.2184	0.1565	0.2095	0.5671	0.4703	0.5540
non-LGBTQ+	346	76.21%	0.2098	0.1881	0.2199	0.1758	0.2064	0.5719	0.4769	0.5595

Table 9: Alpha Values and Diversity Indices for Sexual Orientation (simplified)

SEXUAL ORIENTATION & SOCIOECONOMIC	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Non-LGBTQ+ Lower	46	0.2091	0.1874	0.2226	0.1708	0.2101	0.5721	0.4761	0.5595
Non-LGBTQ+ Middle	172	0.2114	0.1859	0.2206	0.1750339	0.2071	0.5721	0.4768	0.5596
Non-LGBTQ+ Upper	128	0.2079	0.1914	0.2179	0.1787	0.2041	0.5715	0.4775	0.5593
LGBTQ+ Lower	23	0.2087	0.2087	0.2165	0.1516	0.2146	0.5662	0.46918	0.5530
LGBTQ+ Middle	69	0.2172	0.2032	0.2216	0.1504	0.2076	0.5662	0.4681	0.5528
LGBTQ+ Upper	32	0.2048	0.2020	0.2146	0.1697	0.2090	0.5691	0.4747	0.5566

Table 10: Alpha Values and Diversity Indices for Sexual Orientation & Socioeconomic Combination

Furthermore, to determine if there is no significant difference of average relative weight values, statistical testing was conducted.

The result aligned with the trend mentioned above. For the subgroup Sexual Orientation (Simplified), it showed that there was a significant difference in the average relative weight value for the attribute *Sexual Orientation* ($p = 0.000002287$) and *Political View* ($p = 0.0001934$), with the decision of 10% risk.

Nature of Study Results

Lastly, it is important to acknowledge that the results were *statistically insignificant* due to the limitation of data collection. The data for this research was acquired through the survey that was

composed through Qualtrics and sent to the Emory community through varying methods: direct emails, public chat platforms, ListServ emails, and written announcements through their course Canvas platform. The study collected a total of 454 responses, which is only a portion of the entire Emory University community. Further details regarding this limitation are delineated in the following section.

Limitations to the Study and Future Directions

Actual Emory University Demographic Statistics

Emory University consists of about 8,040 undergraduate students (5,700 at Emory College, 990 at Oxford College, 850 at Emory Goizueta Business School, and 500 at Nell Hodgson Woodruff School of Nursing) ("Facts and Stats"). Additionally, Emory University has 7,000 graduate students ("Emory University Facts"). The faculty population of Emory University is approximately 12,741. See *Graph 4* for the proportion graph of *Title* of Emory University.

According to *Gender*, it is reported that the student population is approximately 5,794 men (40.19%) and 8,621 women (59.71%) ("Emory University Diversity"). For the faculty, staff, and administrator population, there are approximately 5,025 men (41.39%) and 7,116 women (58.61%) ("Emory University Diversity"). See *Graph 7* for the proportion graph of *Gender* of Emory University. This study also includes another type under the attribute of gender, which is "Other, gender".

For *Race/Ethnicity*, Emory University undergraduate student's distribution is 2,271 Asian (15.77%), 1,500 African American (10.42%), 1,177 Hispanic (8.173%), 6,191 White (42.99%), 2,406 International (16.71%), 505 Multi-Ethnic (3.507%), 341 Unknown (2.368%), and 10 Native Hawaiian or Pacific Islander (0.0694%) ("Emory University Diversity"). The faculty,

staff, and administrator population's ethnic distribution are 1,371 Asian (12.21%), 3,016 Black or African American (26.87%), 0 Hispanic (0.000%), 6,678 White (59.49%), 0 International (0.000%), 148 Multi-Ethnic (1.318%), 0 Unknown (0.000%), and 12 Native Hawaiian or Pacific Islander (0.1069%) ("Emory University Diversity"). See *Graph 11* for the proportion graph of *Race/Ethnicity* of Emory University.

The types of *Race/Ethnicity* that were listed for this study differs from the report from "Emory University Diversity", as the study used the reference of the Census Questionnaire for the types. The study did not include International or Unknown. But it instead included American Indian or Alaska Native and Other.

Limitations

As stated above, this study does not include the entire Emory community in the data, only those who participated in the survey made for this study (310 Emory University undergraduate and graduate students and 144 Emory University faculty, staff, and administrators. Therefore, in it, if the study were to study the entire Emory community, the results would have been different with more data.

According to the actual demographic statistics of the Emory University community, this study only includes 2.061% of the Emory University student (undergraduate and graduate student) population and 1.130% of the faculty population ("Emory University Facts").

Also, this paper modified the model to formulate a linear functional form that ignores the notion of intersectionality. Additionally, a minimal number of types for each attribute were selected with the anticipation of small sample size. Therefore, it is possible that the increase of number of types within an attribute can artificially increase the diversity index. For example, this could be the reason that *Race* has a higher diversity index than *Gender*.

Future Direction

This study could further proceed in the future with more accurate data that covers more of the Emory University community. Additionally, the methods used in this study could be applied in other academic settings, workplaces, and communities to determine the *true* diversity of the group, with the inclusion of the participants' relative weight of each attribute to the notion of diversity.

Also, this study only included five attributes to analyze: *Gender*, *Sexual Orientation*, *Race/Ethnicity*, *Political View*, and *Socioeconomic*. There are more diversity attributes that can be incorporated into the further studies. Also, more types could be declared under each attribute

as well. This study was made to be concise with the expectation with a low participation. Therefore, for a more significant data result, only the major types (listed in the Census Questionnaire) were included. For example, the attribute *Gender* summarizes additional genders that are not ‘Men’ or ‘Women’ as ‘Other gender’. But this could be broken down to include more types such as: Agender, Cisgender, Gender Queer, Nonbinary, and more. This goes for all the other attributes that have been used in this study.

Further for the data analysis, more subgroups could be formed to produce a more intricate data result. Also, more complex analysis processes could be done beyond studying diversity indices with the use of the Simpson’s Diversity Index, average of the relative weight values and the trends of those values ranked by each subgroup. Additionally, the rankings the participants could provide for the question: "_____ is an important attribute for diversity." This study asked for a ranking between 1 (Strongly Disagree) - 5 (Strongly Agree) and gave the freedom to provide any ranking. But this numerical range could be different, or the participants could be asked to give different rankings for each attribute.

Conclusion

This paper aims to analyze the notion of diversity and how the definition could vary according to each individual's background. It also showcases how diversity does not have one solidified definition that could be pinpointed to a single phrase.

The results from this study show that diversity is a matter of perspective. This research studied two main ideas. First, it observed how the subgroups made in this study viewed the Emory population of students, faculty, and all's diverseness. With the varying relative weight values found from the attributes' ranking by the participants and applying these different values to the calibrated diversity indices, it showed that the definition of diversity differed across the subgroup. This was done by observing the relative weight values found for each subgroup. Individuals from different backgrounds all had their unique and personal rankings. They weigh each attribute under the concept of diversity. This would lead to other calibrated diversity indices found through application onto *Equation 3*.

In conclusion, the calibrated diversity indices found were mostly relatively like each other within the population (student, faculty, and all). But, when observing across all the definitions of diversity, it can be observed that the diversity index is consistently higher for students than for faculty population. See *Table 11-26* to compare all the diversity indices for all subgroups. This indicates that according to each subgroup's perspective the Emory University student population is more diverse than the faculty, staff, and administrator population.

Although this study did not cover the entire Emory community, the sample acquired from the survey was able to give a sense of the two ideas listed above. To find a more clarified definition for diversity, further studies regarding diversity taken into different accounts with different perspectives are needed.

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Appendix

Survey

Measuring Calibrated Diversity Index: Participant Survey

Study Title: Measuring Calibrated Diversity Index
Co-Investigator: Minjeong Seok, Emory College of Arts & Sciences

Thank you for your interest in our research study on the diversity index that represents the diversity of the Emory University community. Please complete the survey below confirming eligibility to participate in the study.

Title

- ○ Emory Student (Undergraduate, Graduate)
- ○ Emory Faculty, Staff

Do you meet the eligibility criteria of at least 18 years of age?

- ○ Yes
- ○ No

Figure 1: Survey (Introduction, itle, Eligibility Criteria)

Informed Consent

Below contains all information that will assist you to decide whether to join the study. If you decide to take part, you can change your mind later and withdraw from the research study simply by leaving this page.

1. This study will take approximately 2-5 minutes to complete.

2. The purpose of this study is to research the diversity index to represent the diversity of the Emory University community. This study will delve into the complexity of the definition of diversity and construct a measure of the concept. The novelty of this study is that the diversity index will take the population's perception into consideration. This will allow the results of varying definitions individuals (or groups) at Emory University have of diversity, stemming from differences in backgrounds.

3. The study is funded and approved by the Emory Economics Department.

4. If you join, you will be asked to input your diversity attributes followed by your personal value of the importance of the attributes pertaining to the definition of "diversity".

5. The survey is anonymous and precautions will be taken to protect the privacy of participants. There are minimal foreseeable risks for participating in this study. However, you can optionally provide an email address if you wish to be considered for the raffle.

6. Aside from those who decide to participate in the compensation process by entering their Emory email address, there are no direct benefits to you for participating in this study. At the end of the survey, there will be an **optional** question that asks for your Emory email address if you wish to participate in the random selection for receiving a $10 Gift Card. This study will randomly select thirty (30) participants who participated in the **optional** selection receive a $10 Gift Card.

7. Participation is **voluntary**. You may revoke your authorization at any time by simply exiting the page.

Contact Information

If you have any questions about this study, your part in it, your rights as a participant, or any concerns/complaints about the research you may contact the following:

- Minjeong Seok, Co-Investigator: (310) 968-4407 or minjeong.seok@emory.edu
- Dr. David McMillon, Principal Investigator: (989) 482-5168 or david.mcmillon@emory.edu

Figure 2: Survey (Informed Consent and Contact Information)

What is your gender?

- ○ Man
- ○ Woman
- ○ [ ] Other, please specify

What is your sexual orientation?

- ○ Straight/Heterosexual
- ○ Bisexual
- ○ Homosexual (Gay, Lesbian)
- ○ [ ] Other, please specify

What is your racial/ethnical identity?

Select any that apply

- ☐ Hispanic, Latino, or Spanish origin
- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ [ ] Some other race, please specify

On a scale from 1-5, how would you summarize your political views?

Progressive (Left-Leaning) — Centrist — Conservative (Right-Leaning)

1 2 3 4 5 [ ]

Figure 3: Survey (Personal Demographic: Gender, Sexual Orientation, Racial/Ethnical Identity, Political View)

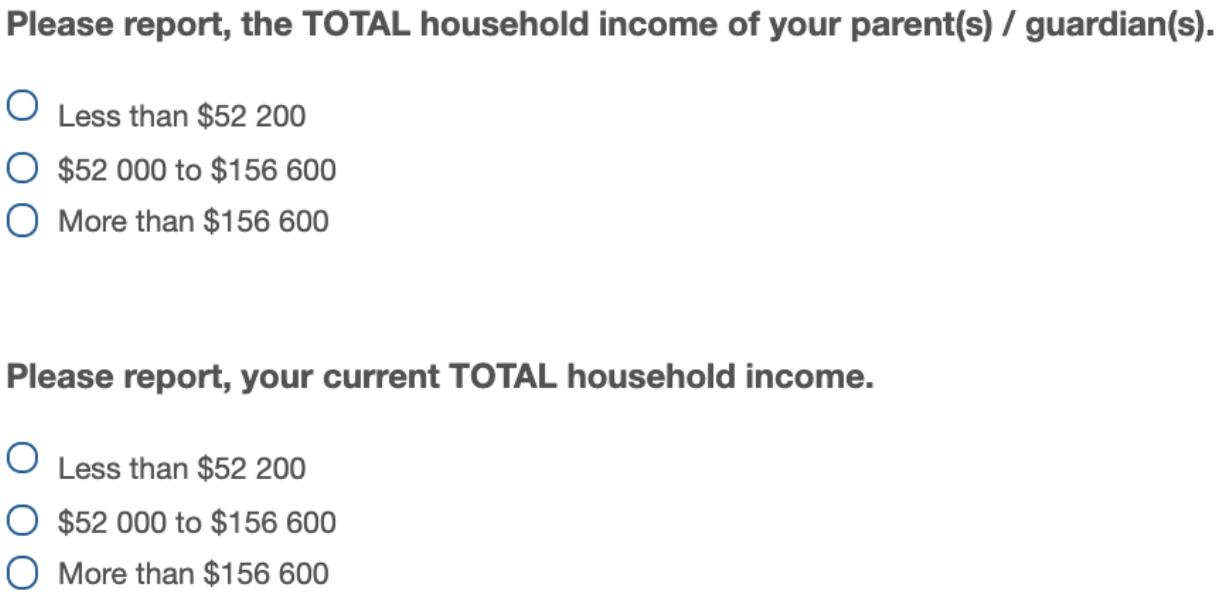


Figure 4: Survey (Personal Demographic: Socioeconomic Student and Faculty version)

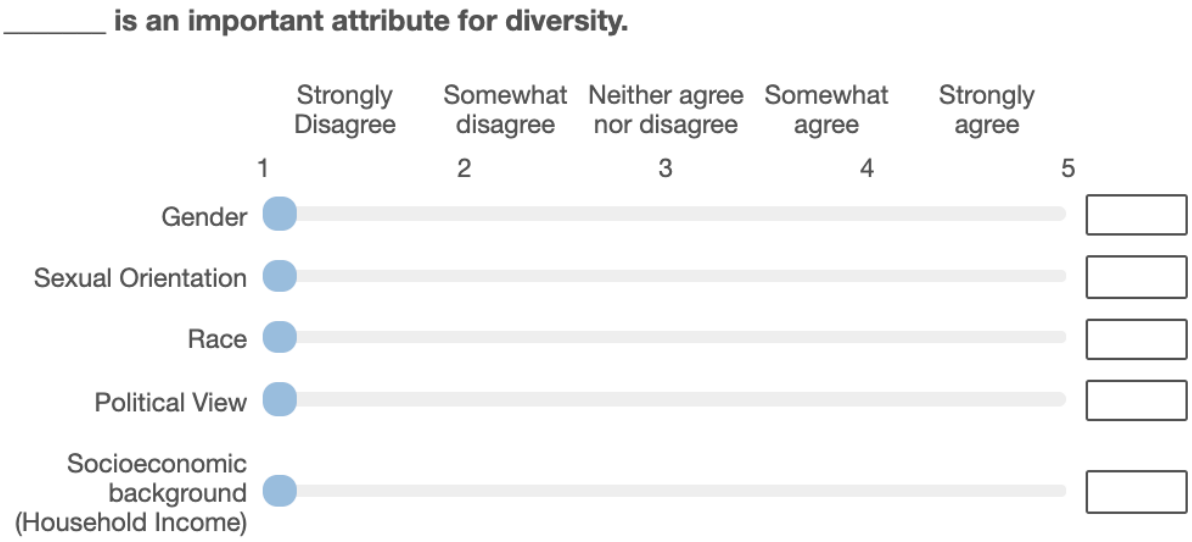


Figure 5: Survey (Personal Ranking Importance Weight on Each Attribute)

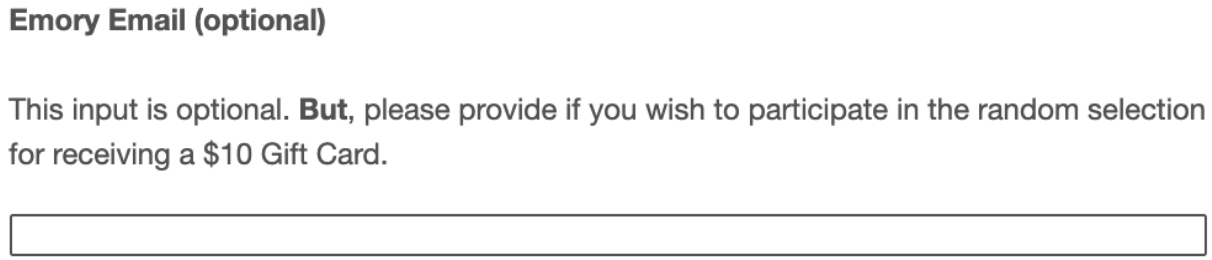
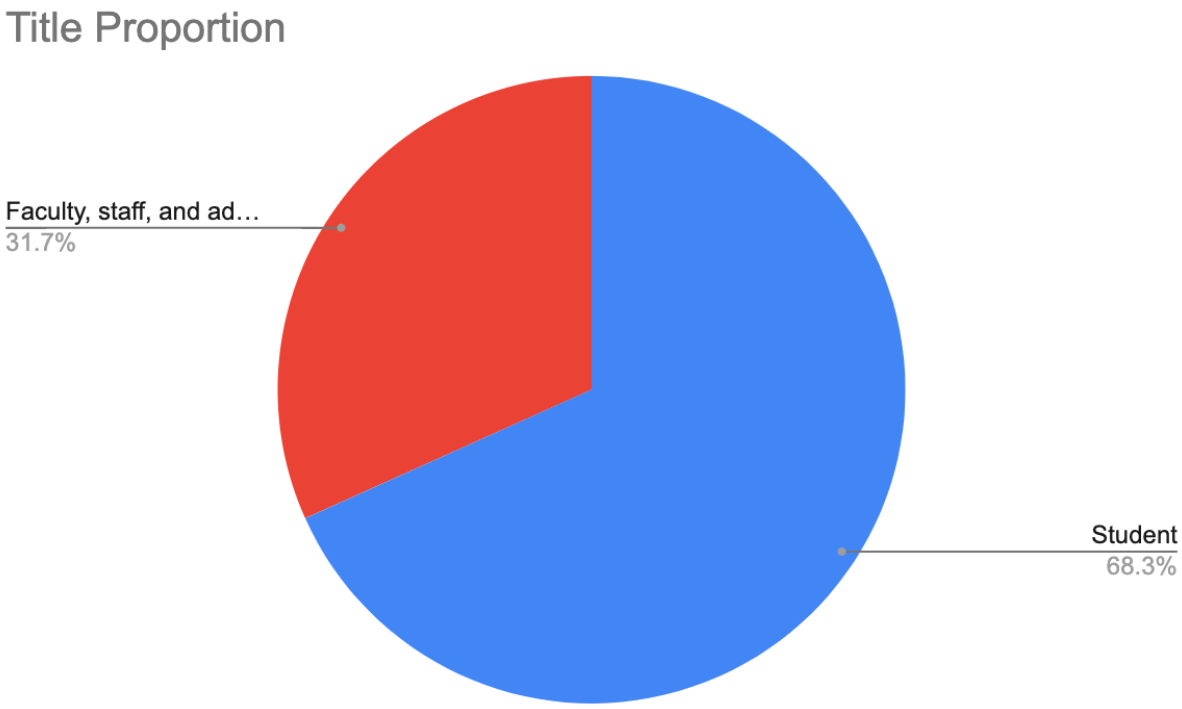


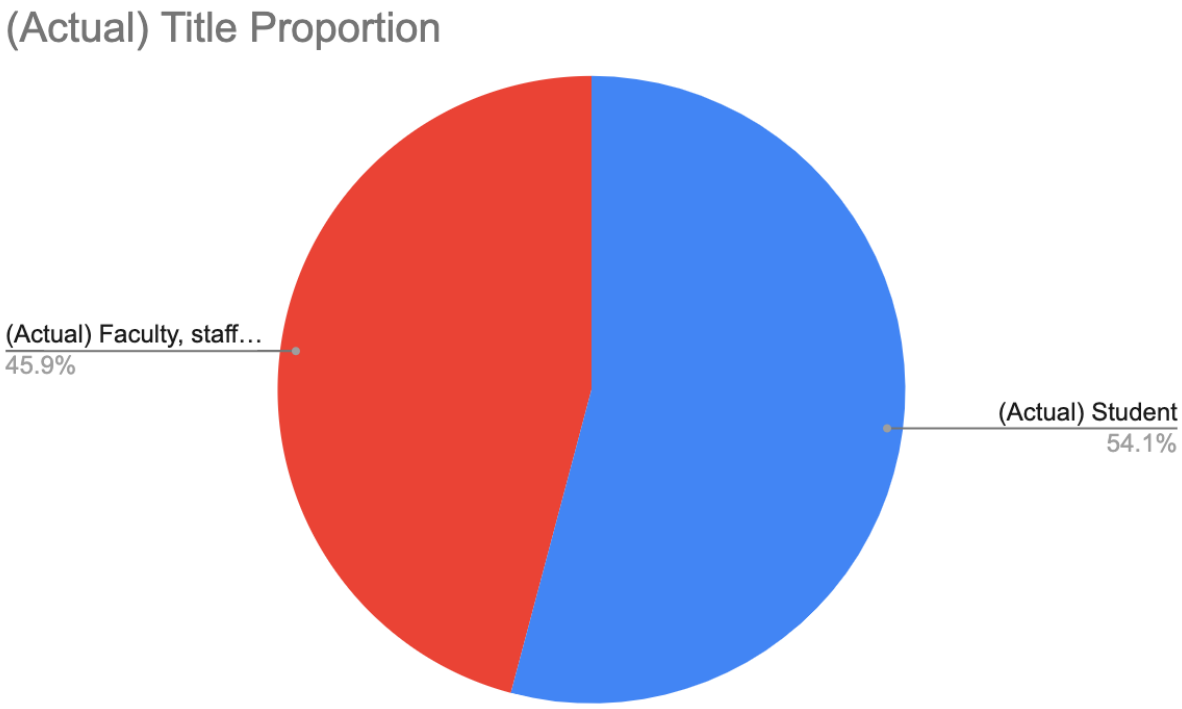
Figure 6: Survey (Optional Section)

Tables and Graphs

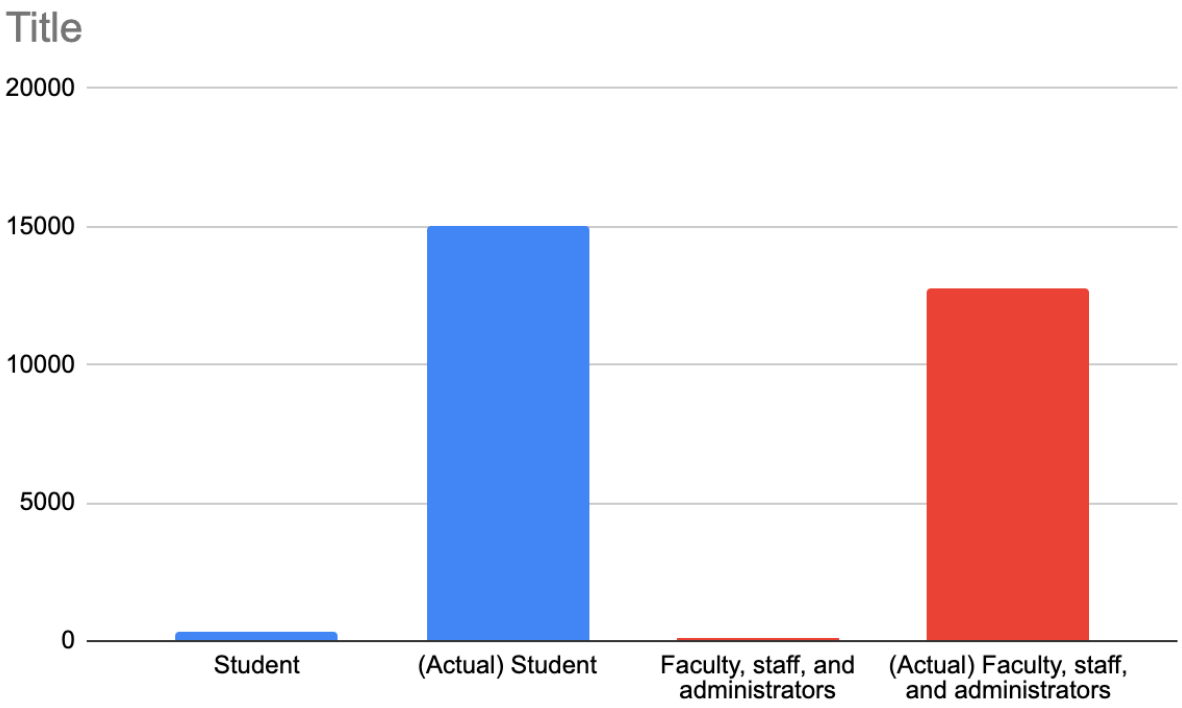
A. Demographic Statistics



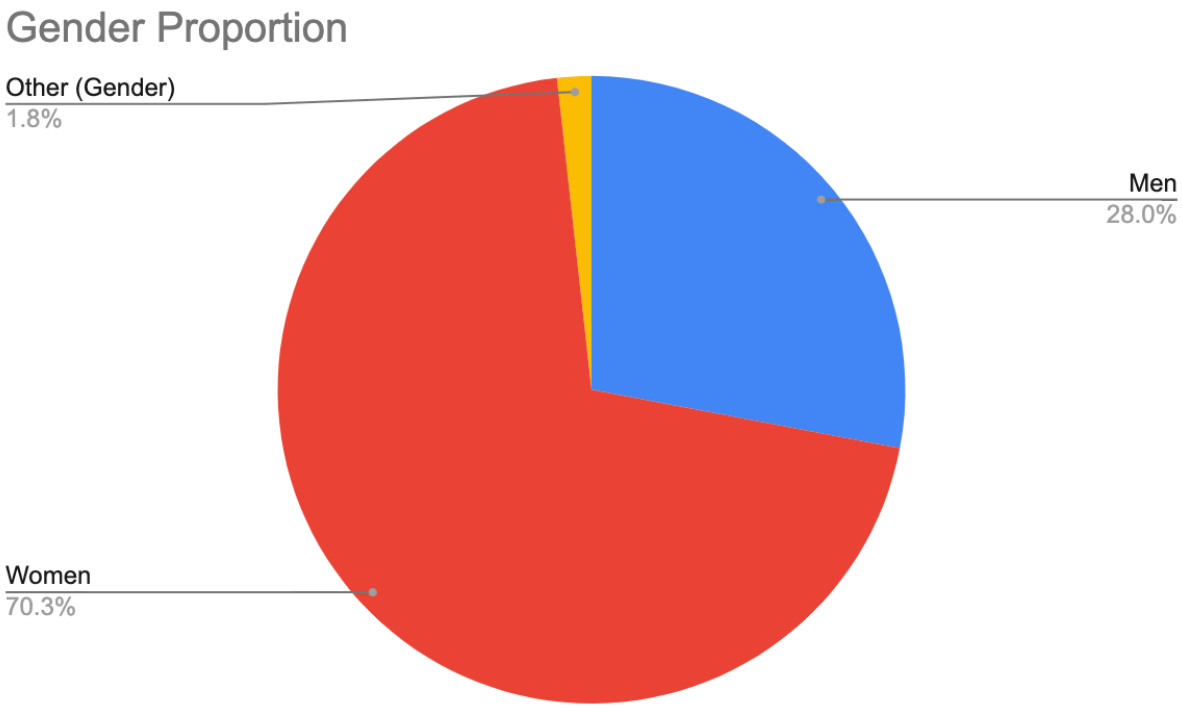
Graph 3: Sample Proportion of Title



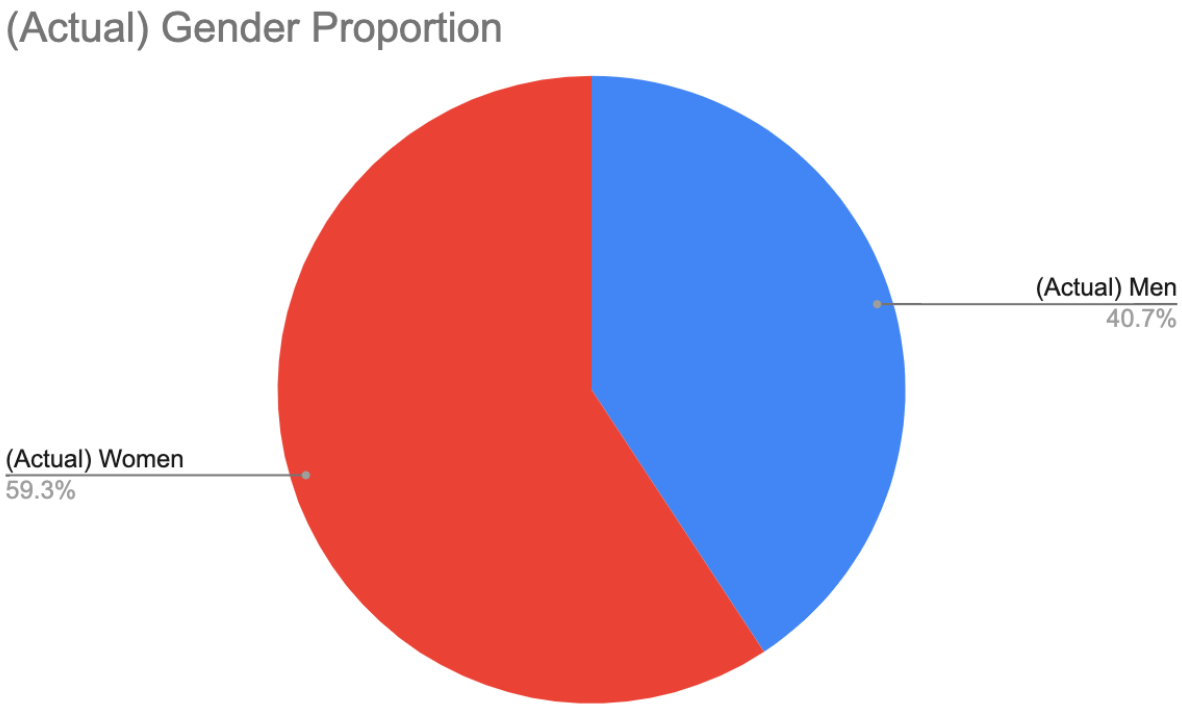
Graph 4: Actual Emory University Proportion of Title



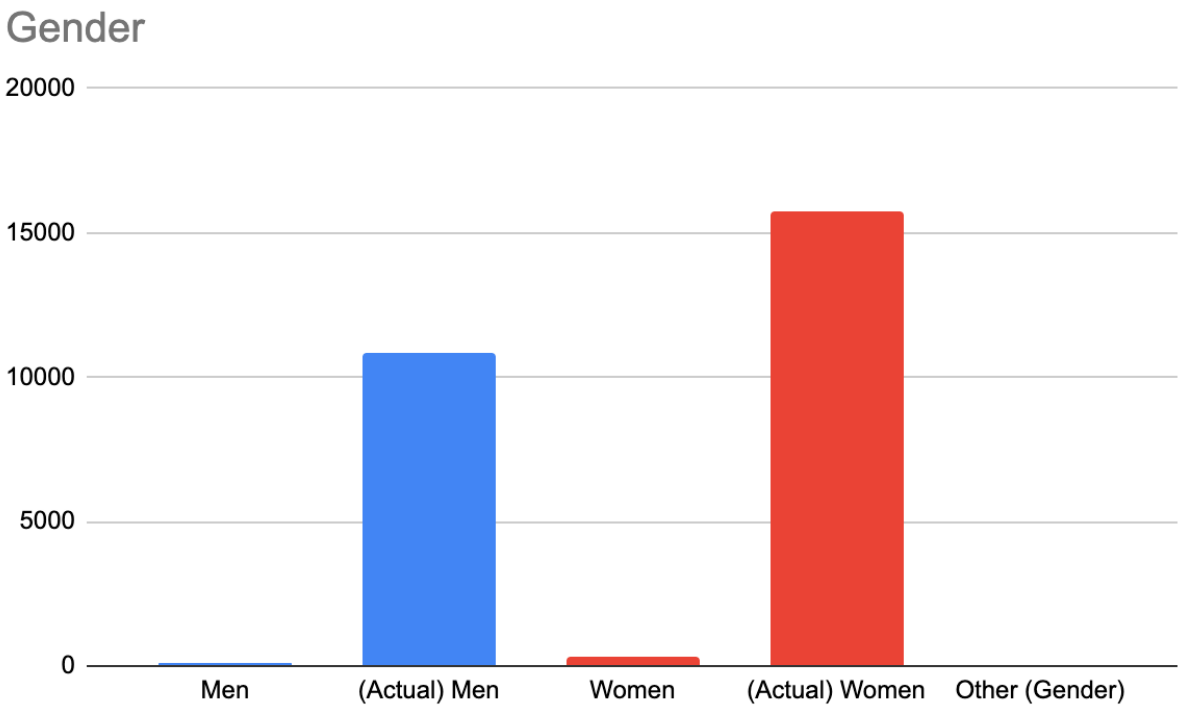
Graph 5: Comparison of Actual Sample Size and Sample Size of Title



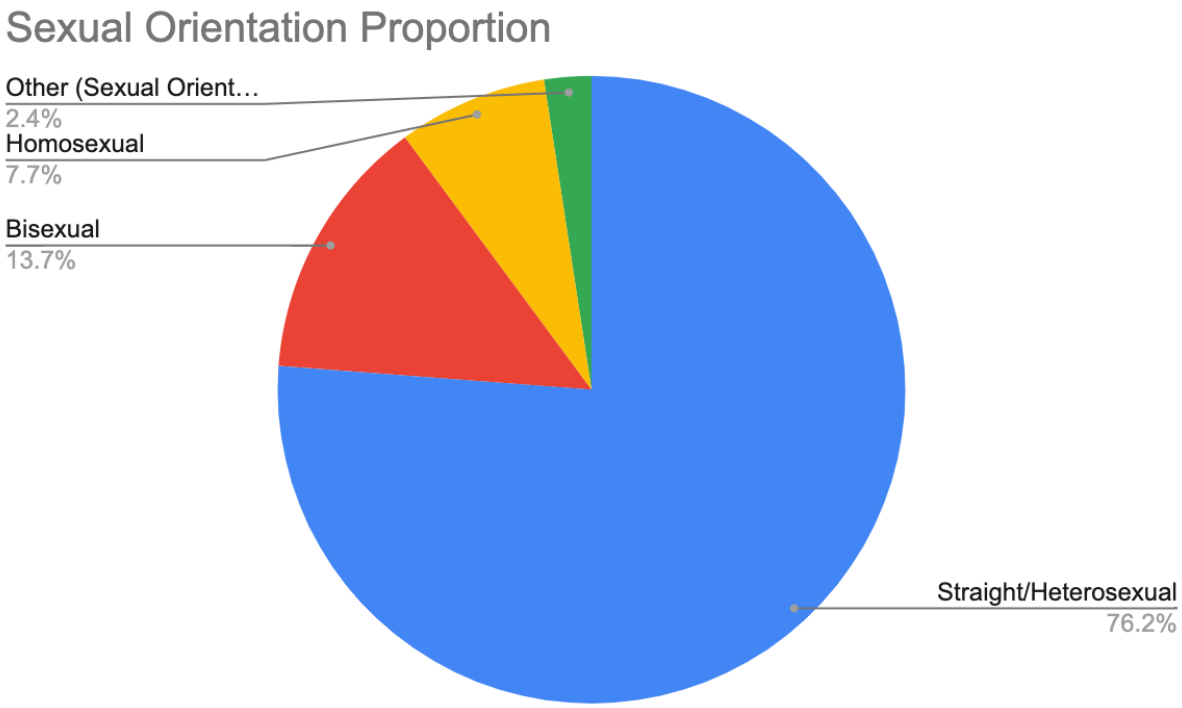
Graph 6: Sample Proportion of Gender



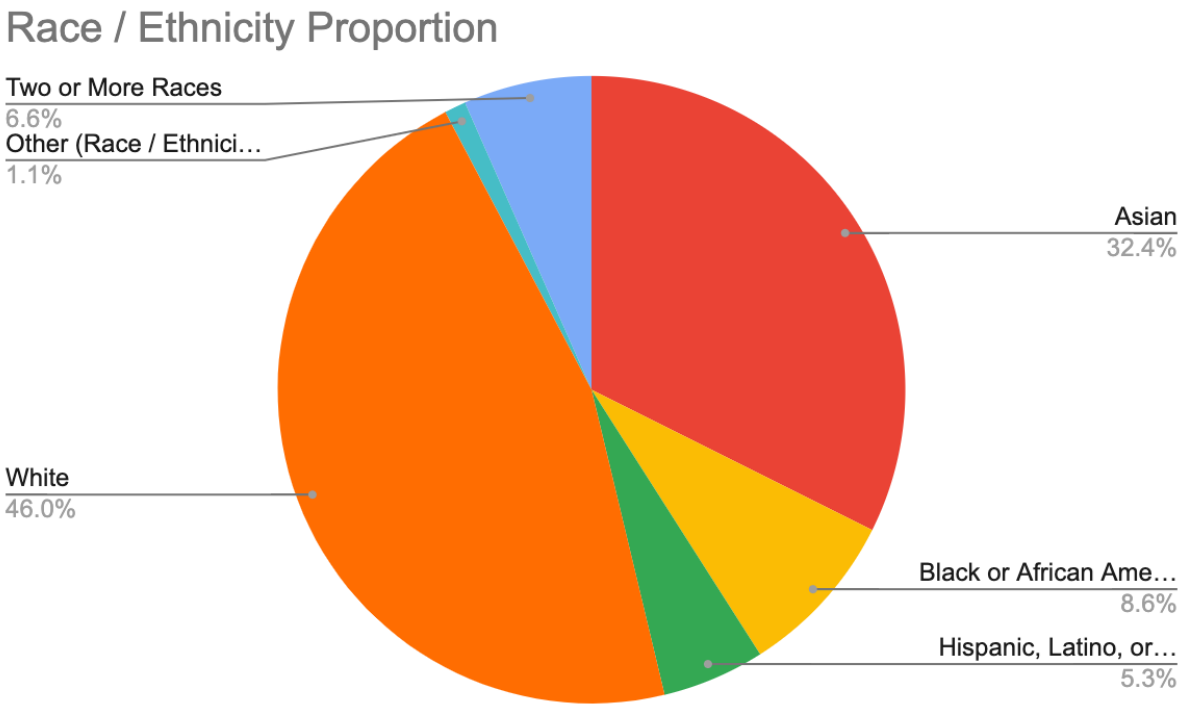
Graph 7: Actual Emory University Proportion of Gender



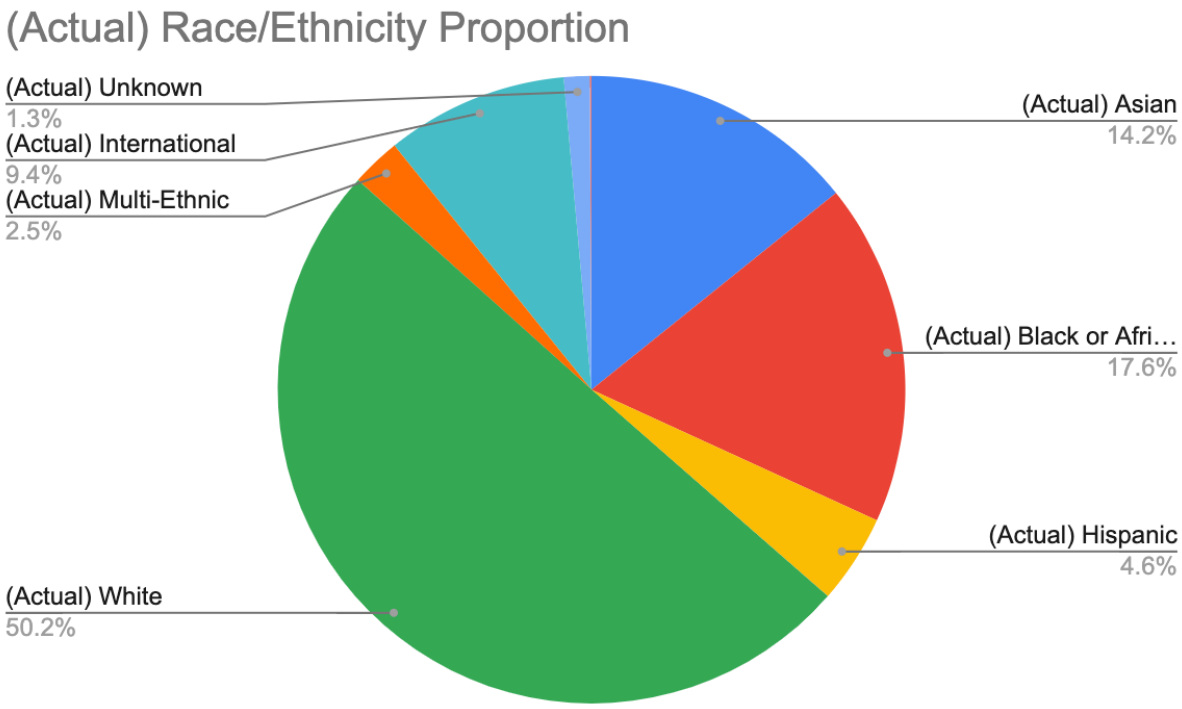
Graph 8: Comparison of Actual Sample Size and Sample Size of Gender



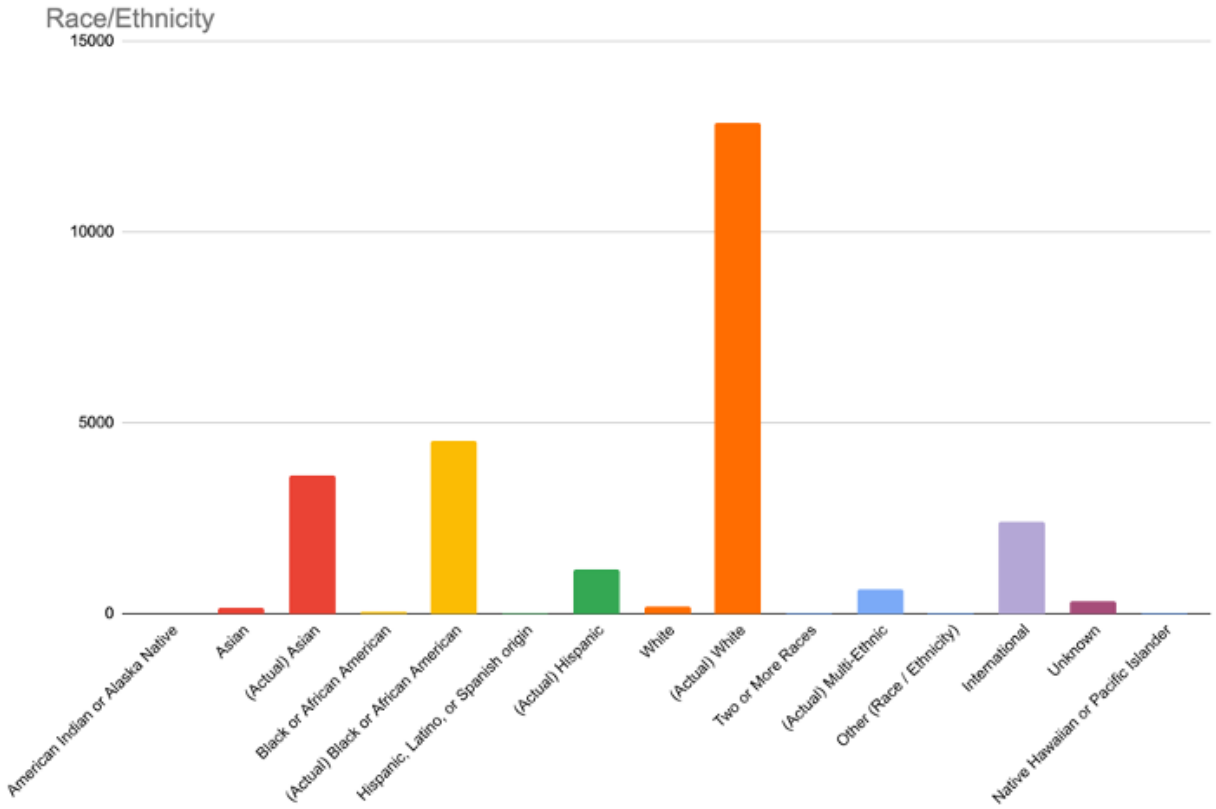
Graph 9: Sample Size of Sexual Orientation



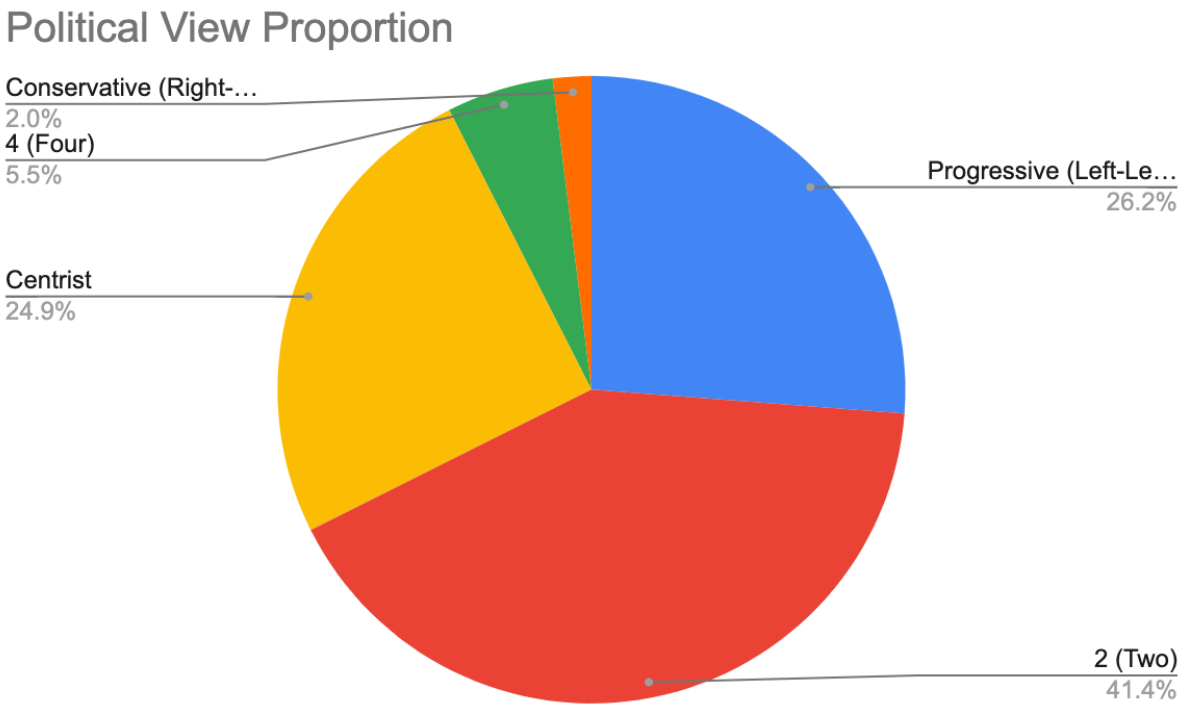
Graph 10: Sample Size of Race/Ethnicity



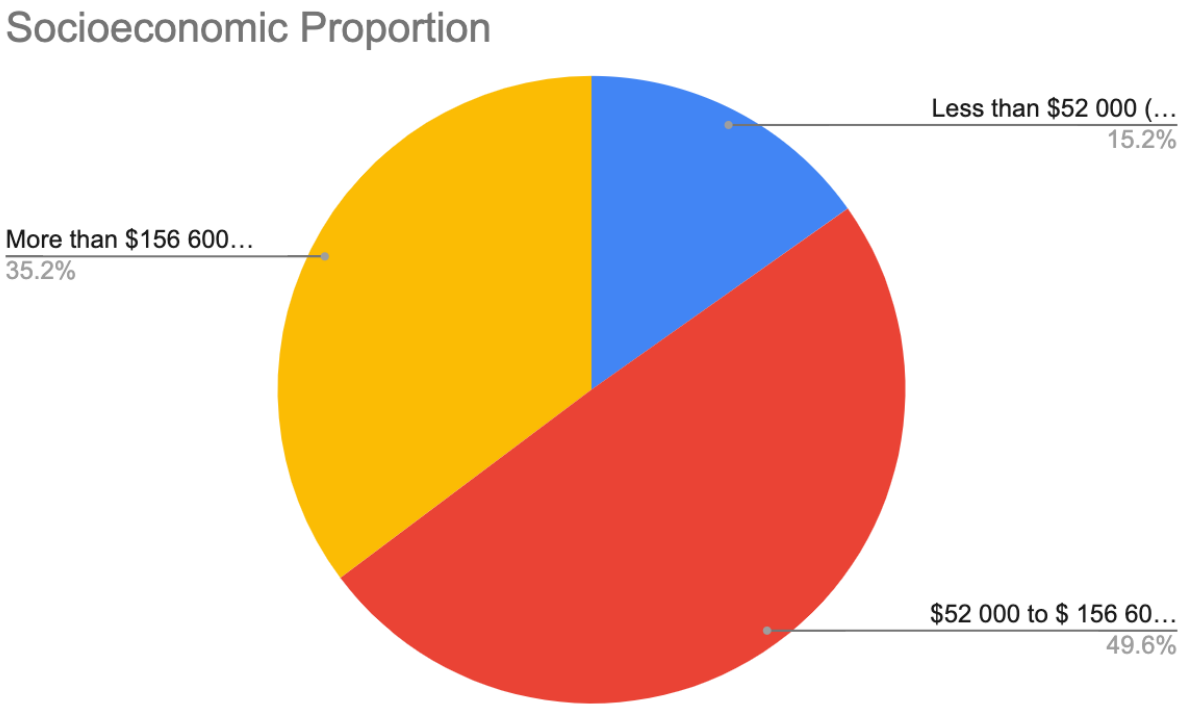
Graph 11: Actual Emory University Proportion of Race/Ethnicity



Graph 12: Comparison of Actual Sample Size and Sample Size of Race/Ethnicity



Graph 13: Sample Size of Political View



Graph 14: Sample Size of Socioeconomic

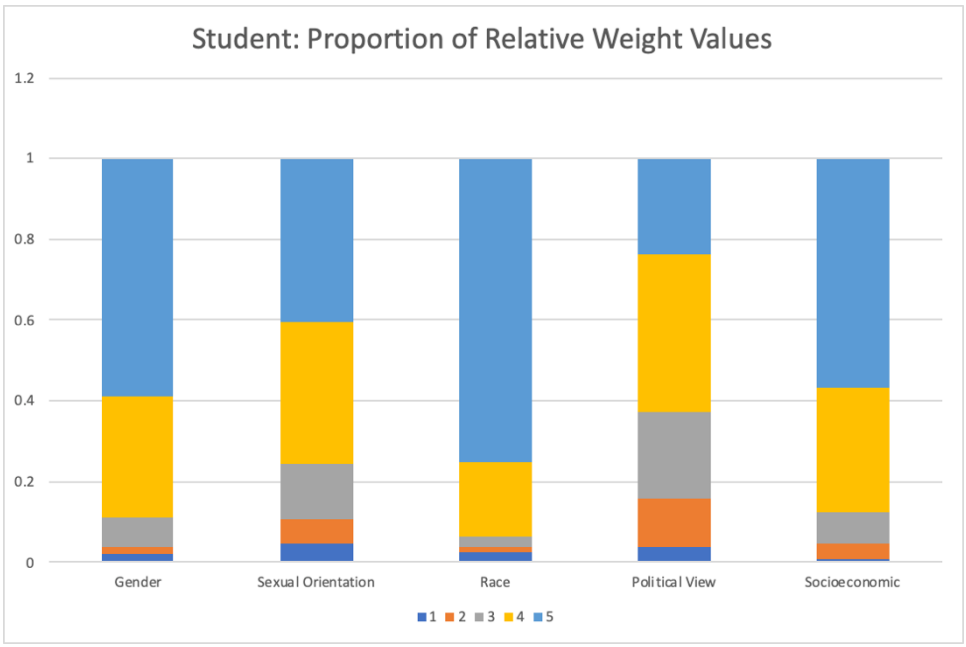
B. Attribute

I. Title

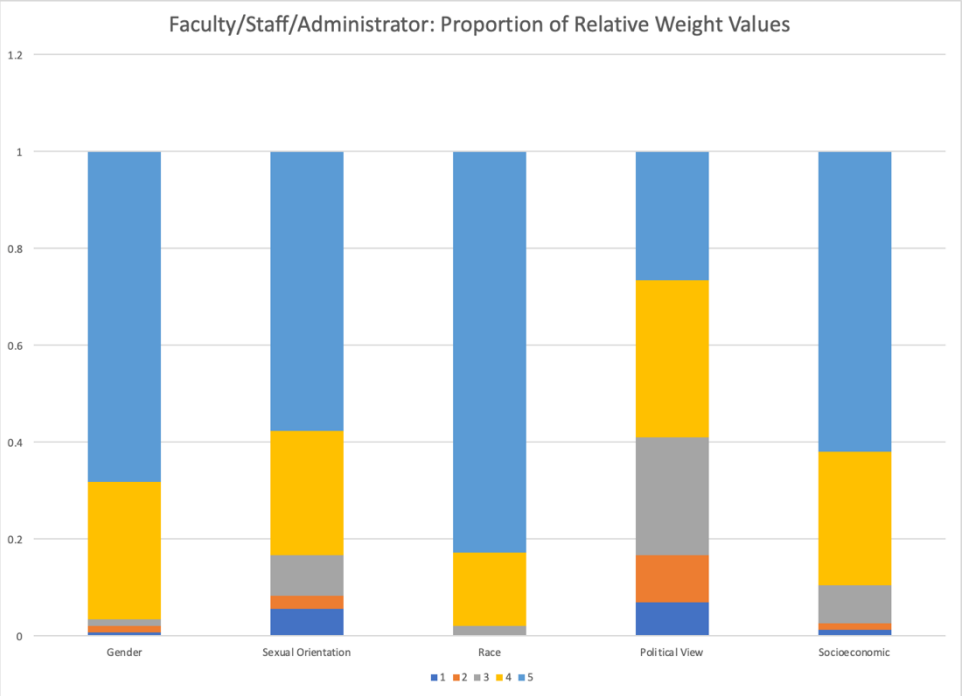
TITLE	n	%	α_g	α_s	α_r	α_p	α_{se}	DI_g	DI_s	DI_r	DI_p	DI_{se}	DI
Student	310	68.28%	0.2094	0.1900	0.2190	0.1735	0.2080	0.4621	0.4054	0.6765	0.6766	0.6346	0.5714
Faculty, Staff, Administrator	144	31.72%	0.2120	0.1960	0.2206	0.1661	0.2053	0.3248	0.3692	0.4918	0.7210	0.5061	0.4734
All	454	100.0%	0.2102	0.1920	0.2195	0.1711	0.2071	0.4287	0.3949	0.6701	0.6960	0.6084	0.5581

Table 11: Alpha Values and Diversity Indices for Title

Graph 15: All: Proportion of Relative Weight Values



Graph 16: Student: Proportion of Relative Weight Values

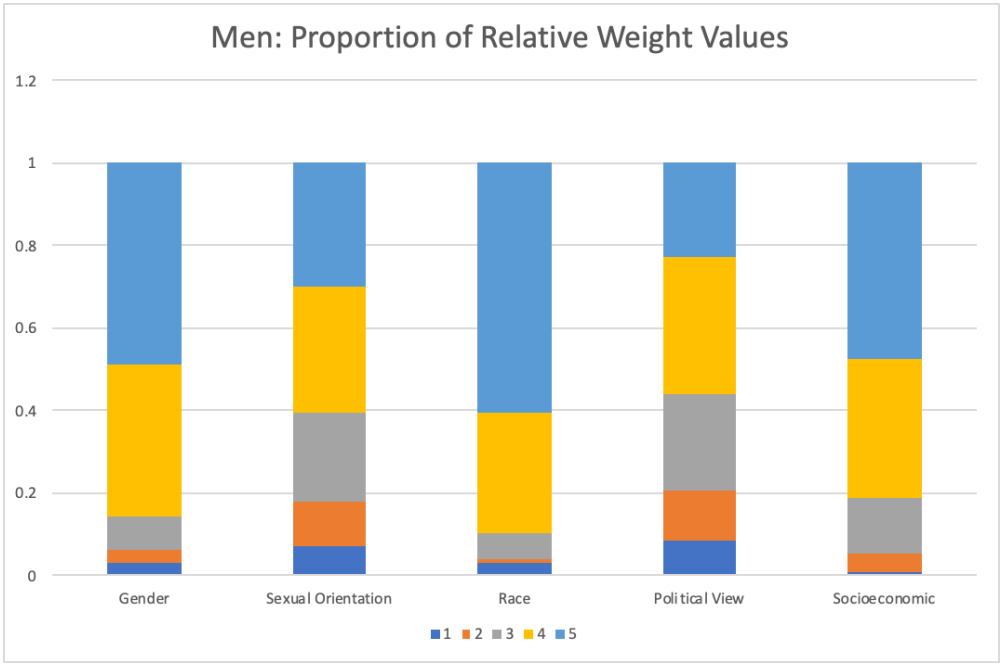


Graph 17: Faculty/Staff/Administrator: Proportion of Relative Weight Values

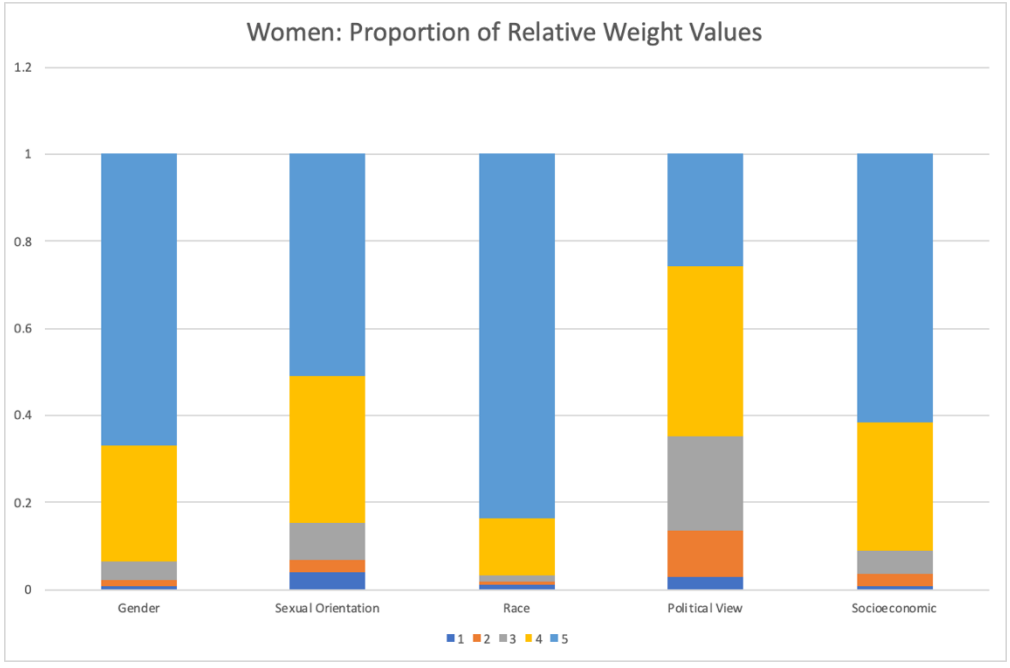
II. Gender

GENDER	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Man	127	27.97%	0.2120	0.1822	0.2210	0.1743	0.2104	0.5729	0.4770	0.5603
Woman	319	70.26%	0.2095	0.1947	0.2188	0.1716	0.2055	0.5702	0.4752	0.5577
Other	8	1.76%	0.2147	0.2260	0.2260	0.1073	0.2260	0.5597	0.4561	0.5449

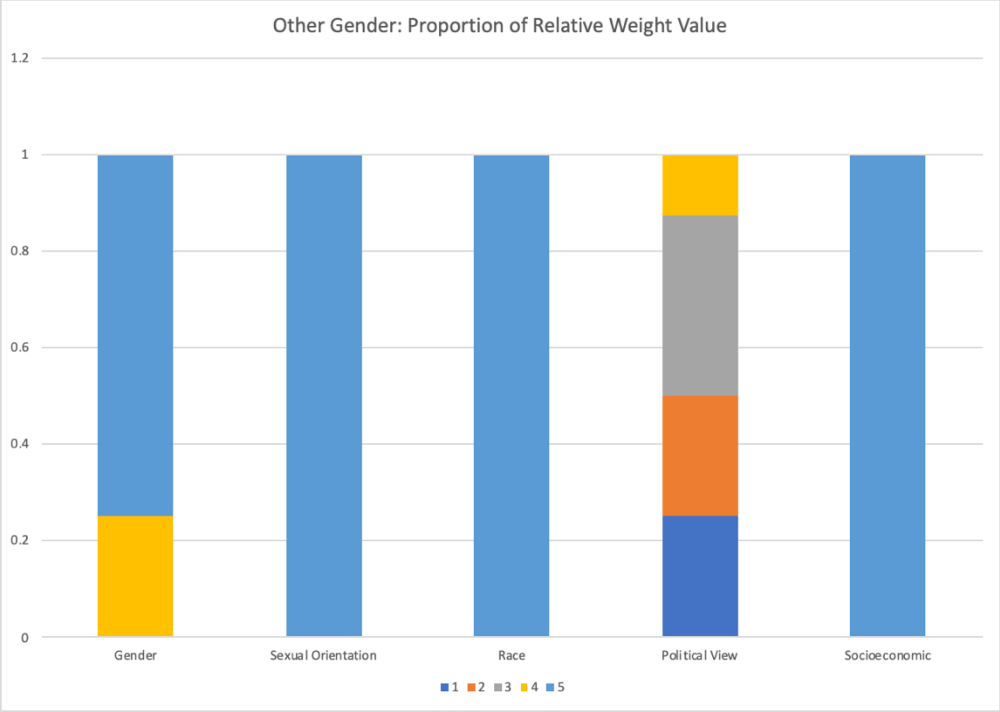
Table 12: Alpha Values and Diversity Indices for Gender



Graph 18: Men: Proportion of Relative Weight Values



Graph 19: Women: Proportion of Relative Weight Values

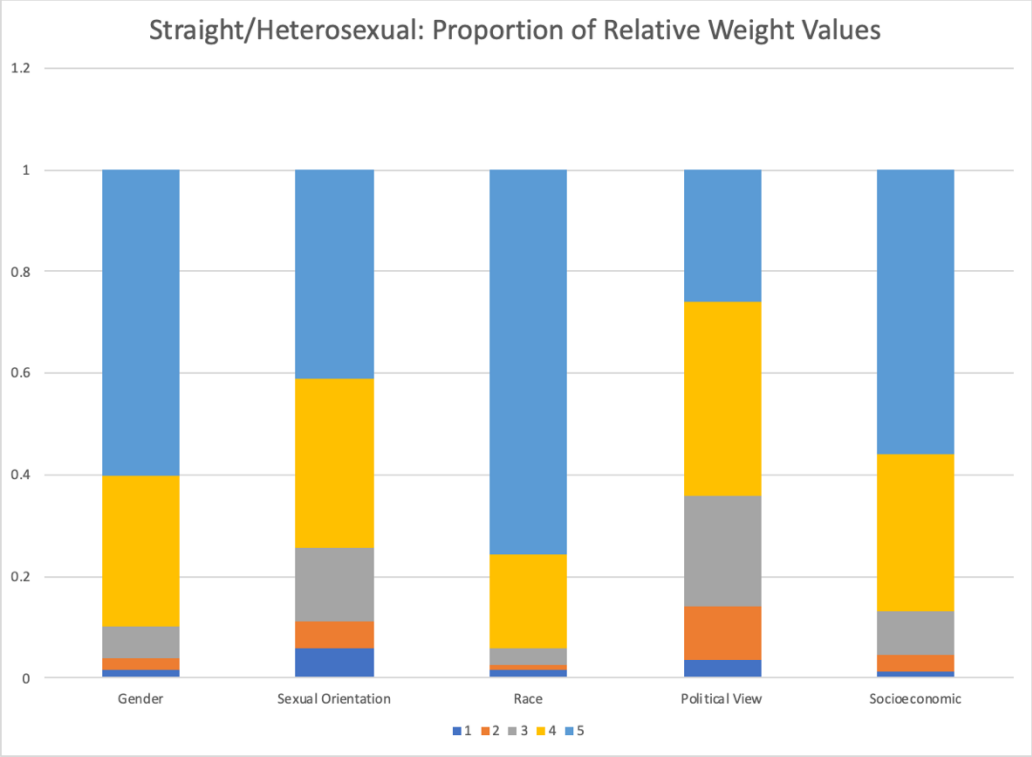


Graph 20: Other Gender: Proportion of Relative Weight Values

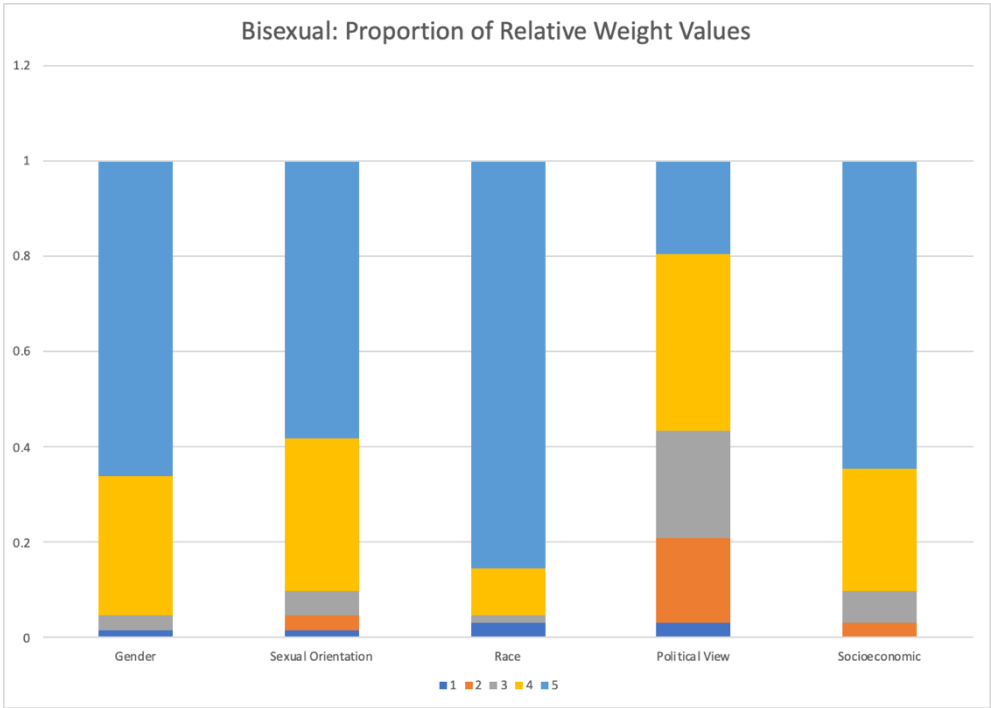
III. Sexual Orientation

SEXUAL ORIENTATION	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Heterosexual	346	76.21%	0.2098	0.1881	0.2199	0.1758	0.2064	0.5719	0.4769	0.5595
Bisexual	62	13.66%	0.2104	0.2030	0.2178	0.1615	0.2074	0.5677	0.4718	0.5548
Homosexual	35	7.71%	0.2135	0.2018	0.2174	0.1563	0.2109	0.5672	0.4702	0.5540
Other	11	2.42%	0.2125	0.2167	0.2250	0.1292	0.2167	0.5631	0.4625	0.5491

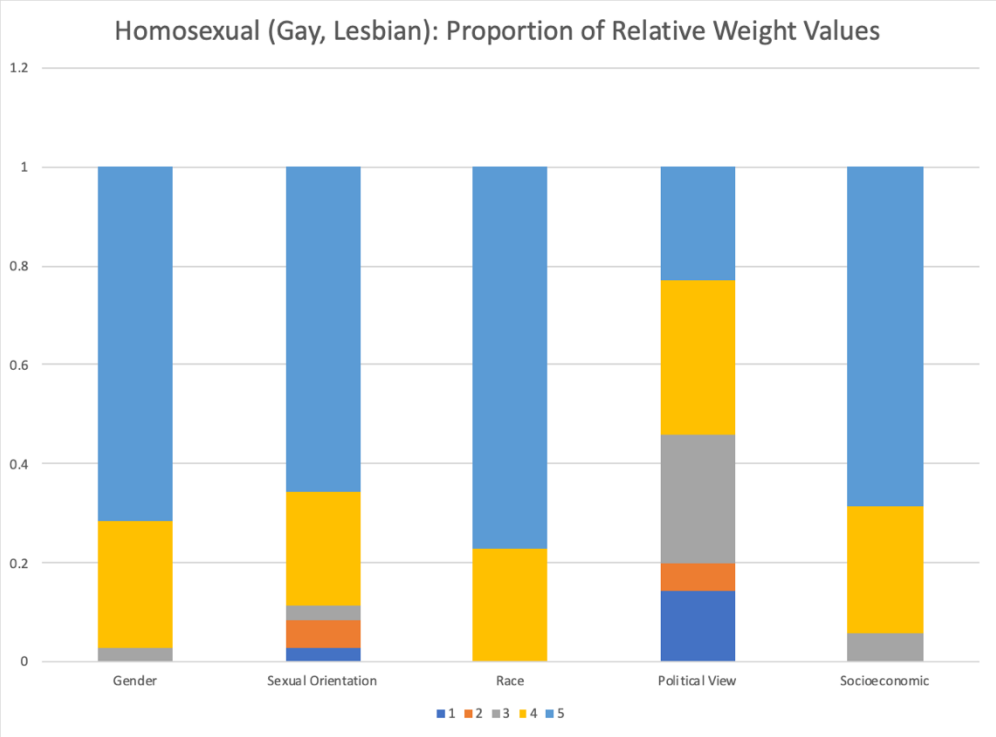
Table 13: Alpha Values and Diversity Indices for Sexual Orientation



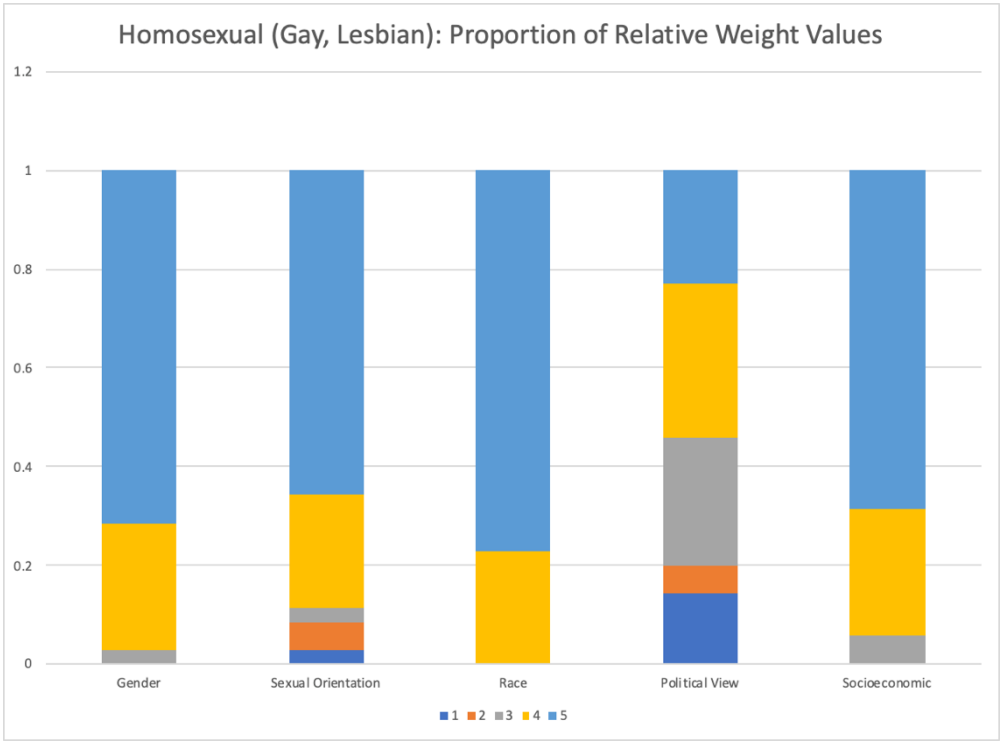
Graph 21: Straight/Heterosexual: Proportion of Relative Weight Values



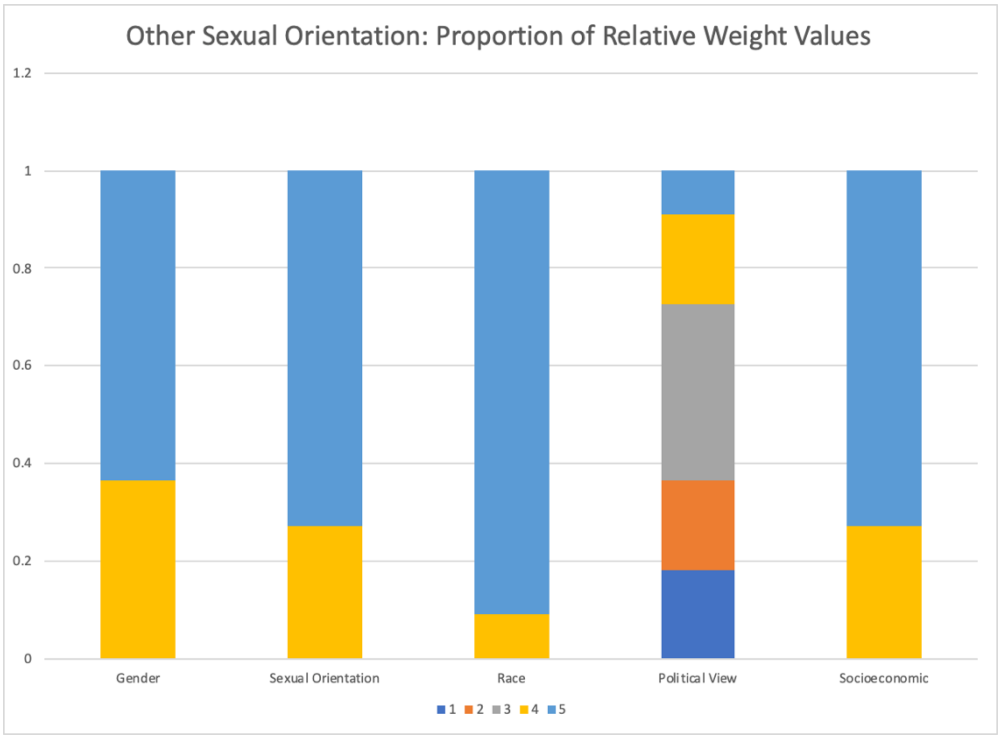
Graph 22: Straight/Heterosexual: Proportion of Relative Weight Values



Graph 23: Bisexual: Proportion of Relative Weight Values



Graph 24: Homosexual (Gay, Lesbian): Proportion of Relative Weight Values

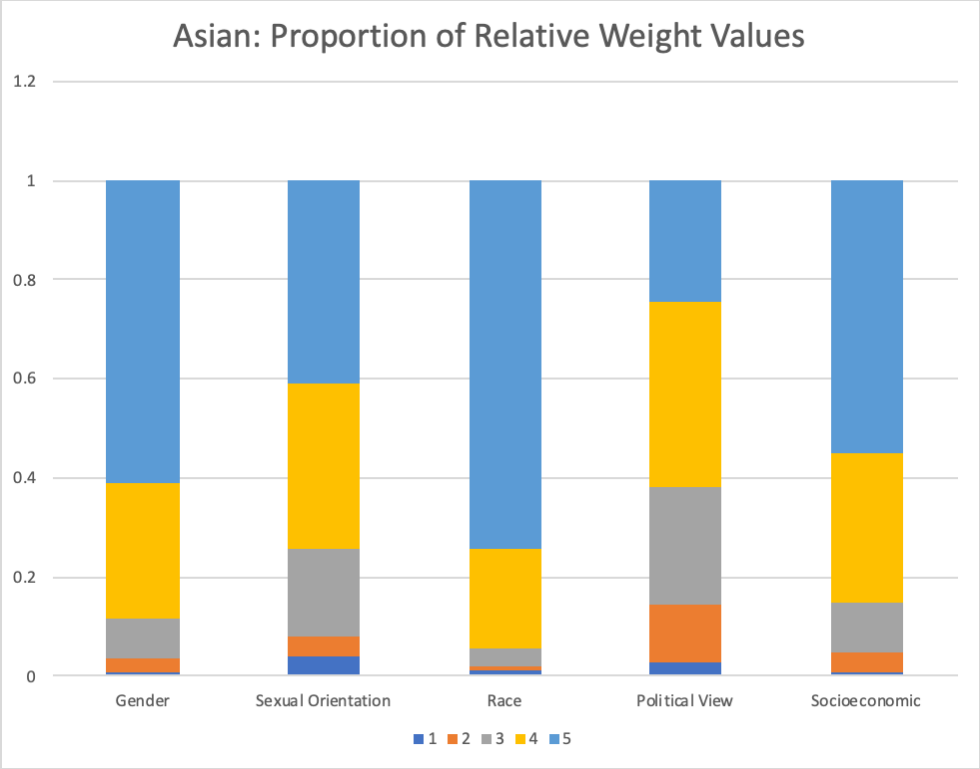


Graph 25: Other Sexual Orientation: Proportion of Relative Weight Values

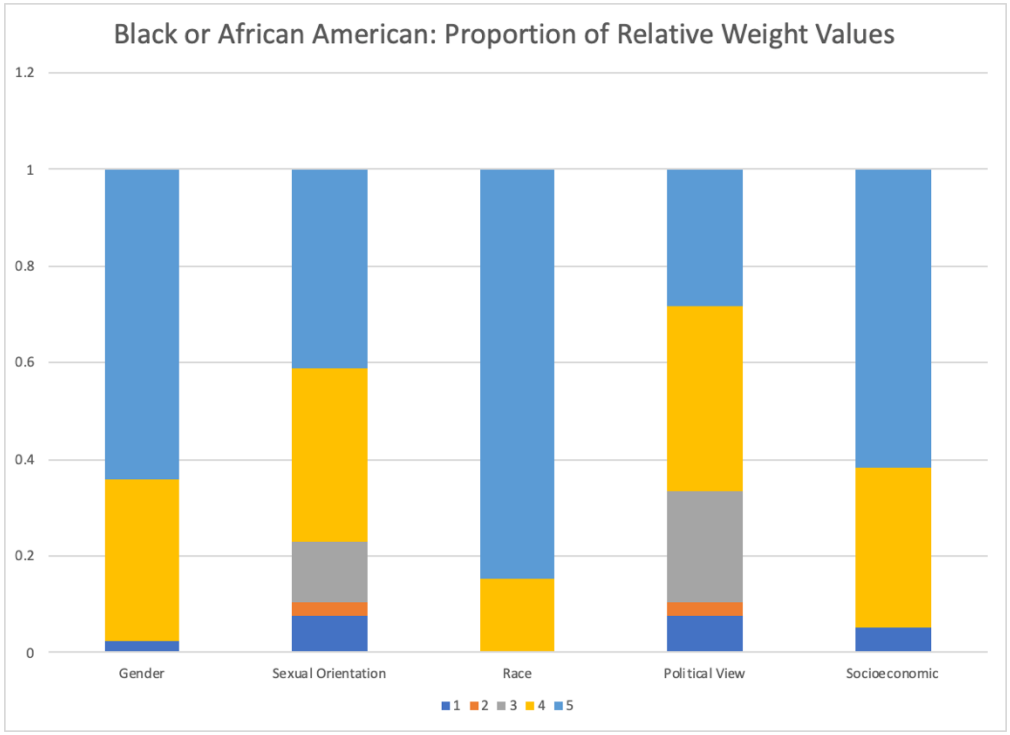
IV. Race

RACE	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
American Indian or Alaska Native	0	0%	0	0	0	0	0	0	0	0
Asian	147	32.38%	0.2104	0.1902	0.2197	0.1744	0.2053	0.5713	0.4763	0.5588
Black/African American	39	8.590%	0.2109	0.1848	0.2239	0.1742	0.2062	0.5726	0.4768	0.5601
Hispanic, Latino, or Spanish origin	24	5.286%	0.2012	0.1933	0.2229	0.1755	0.2071	0.5723	0.4777	0.5601
White	209	46.04%	0.2113	0.1943	0.2183	0.1681	0.2080	0.5698	0.4742	0.5571
Other	5	1.101%	0.2000	0.1700	0.2200	0.1900	0.22	0.5783	0.4843	0.5664
Two or More	30	6.608%	0.2097	0.1960	0.2188	0.1657	0.2097	0.5696	0.4737	0.5568

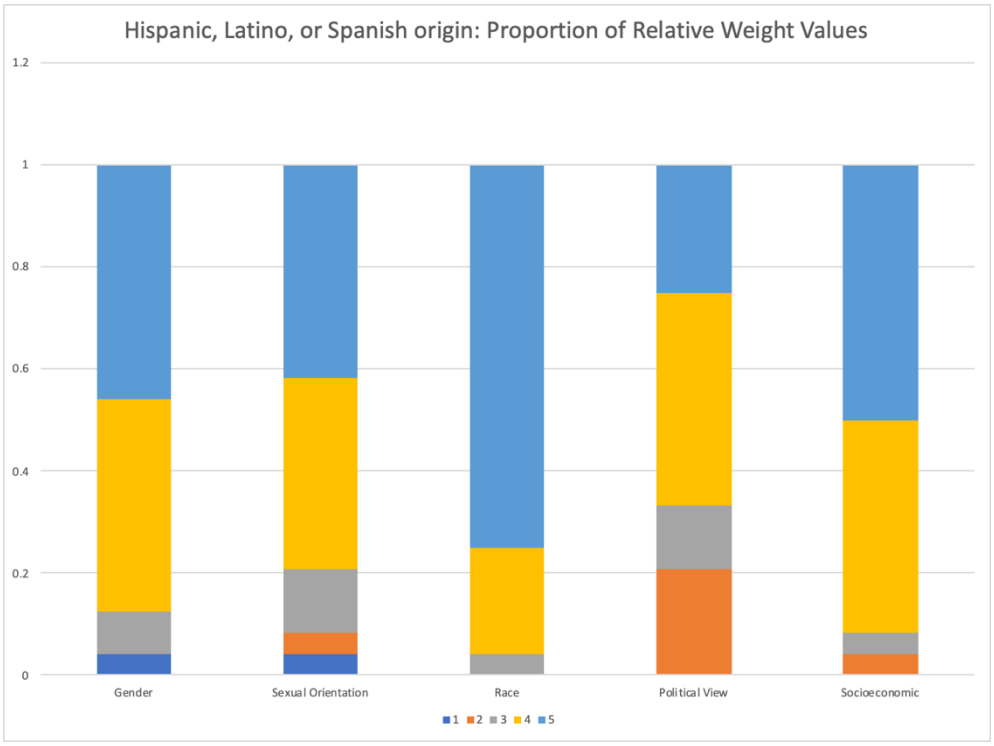
Table 14: Alpha Values and Diversity Indices for Race



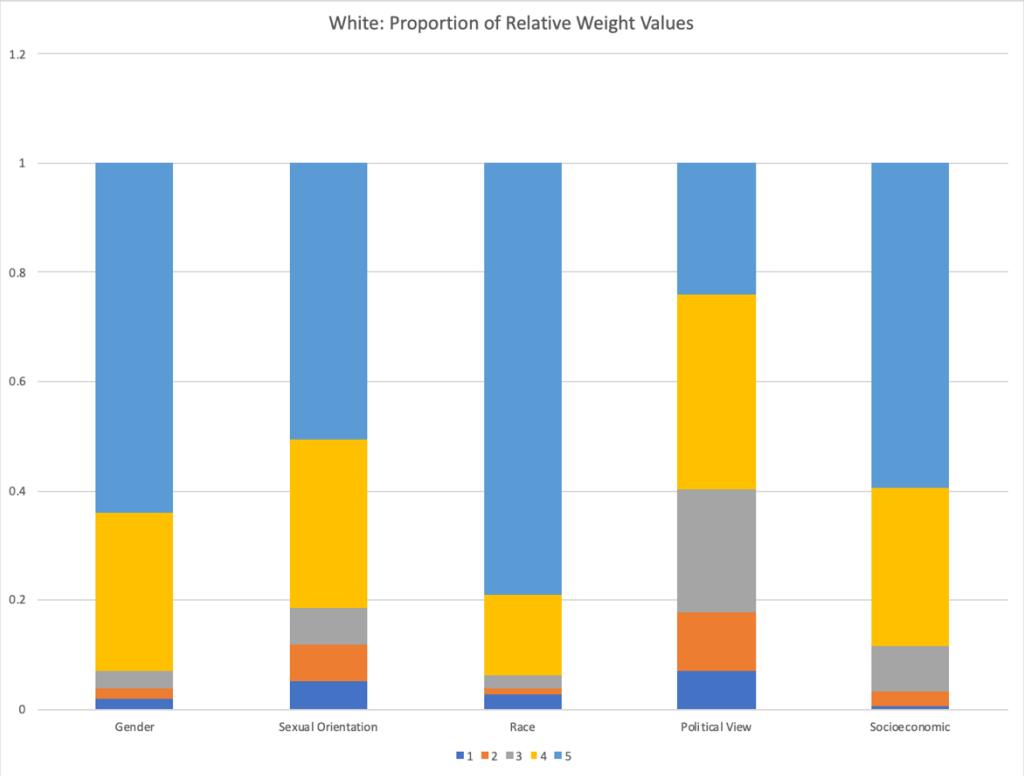
Graph 26: Asian: Proportion of Relative Weight Values



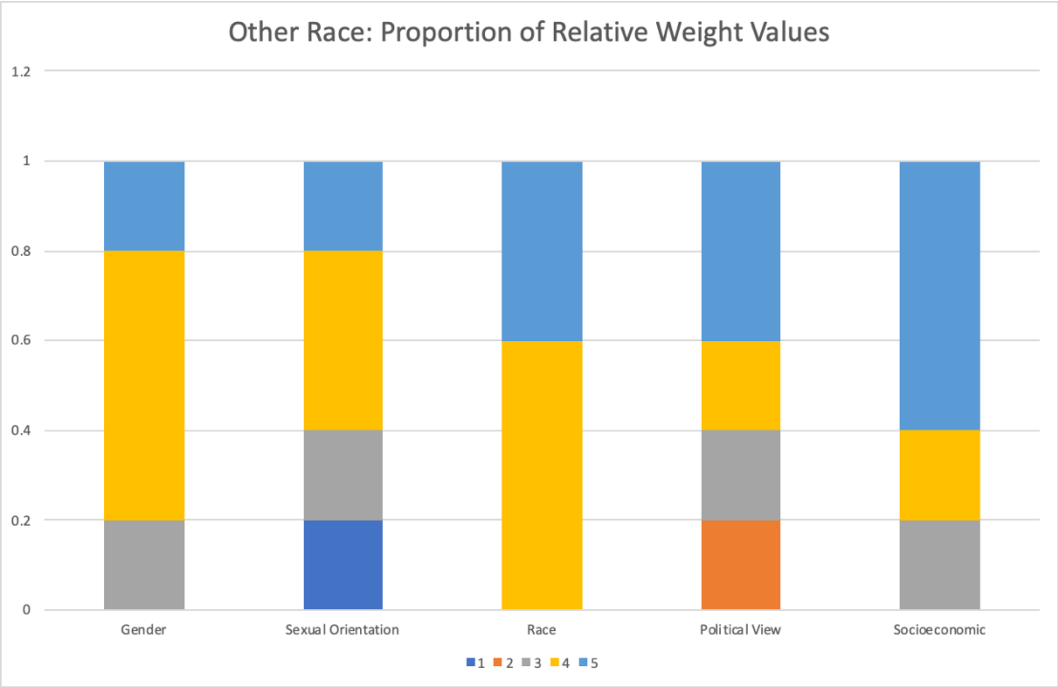
Graph 27: Black or African American: Proportion of Relative Weight Values



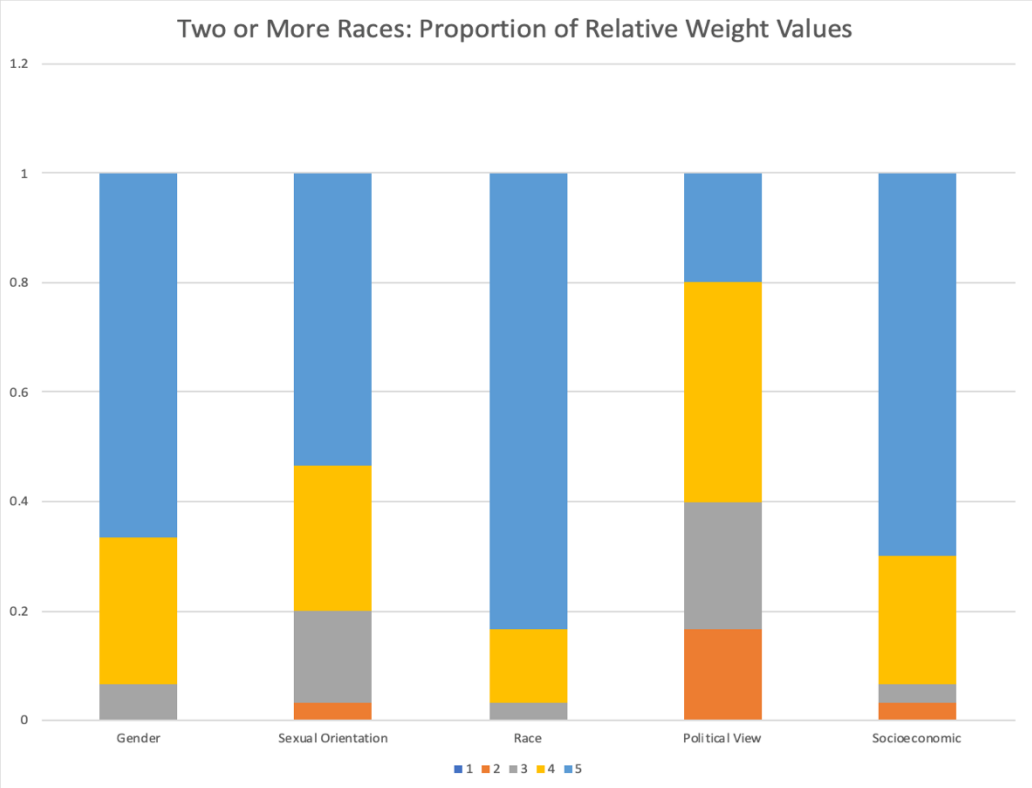
Graph 28: Hispanic, Latino, or Spanish Origin: Proportion of Relative Weight Values



Graph 29: White: Proportion of Relative Weight Values



Graph 30: Other Race: Proportion of Relative Weight Values

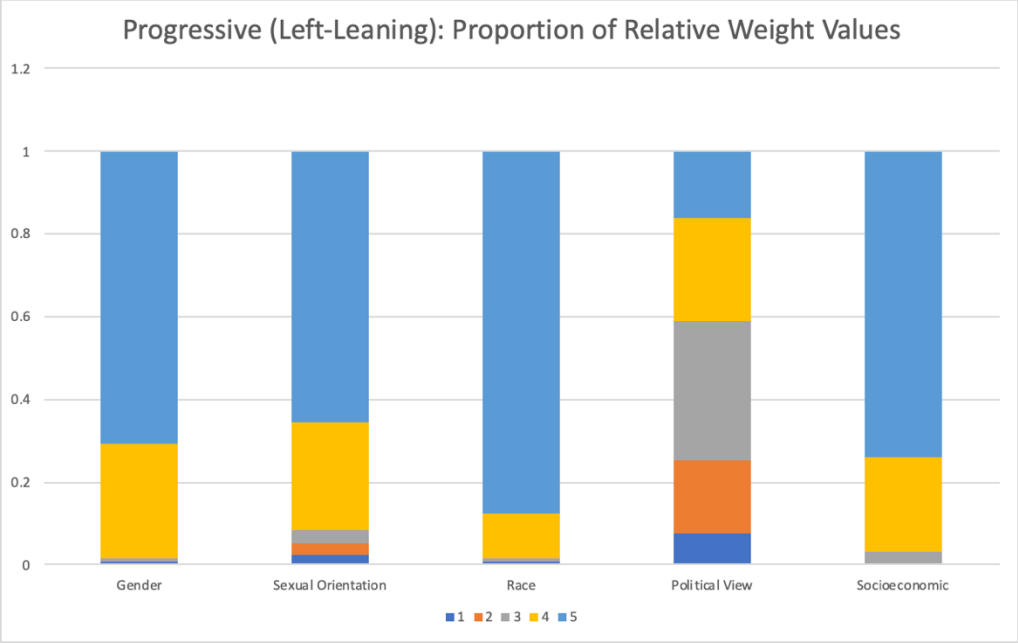


Graph 31: Two or More Races: Proportion of Relative Weight Values

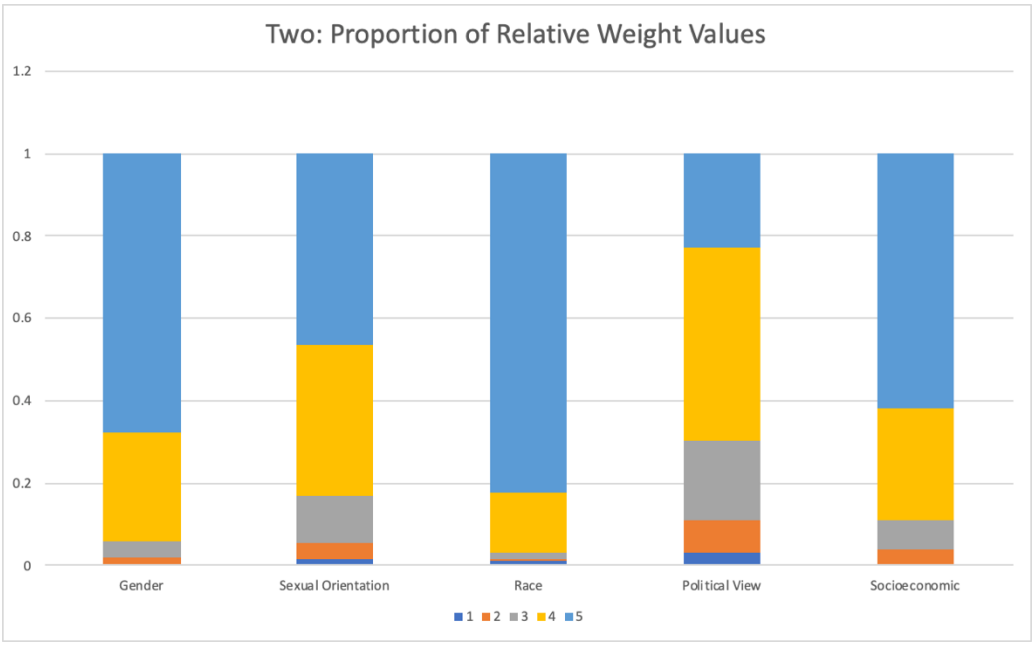
V. Political View

POLITICAL VIEW	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
1	119	26.21%	0.2128	0.2047	0.2204	0.1477	0.2143	0.5664	0.4681	0.5530
2	188	41.41%	0.2105	0.1935	0.2183	0.1732	0.2044	0.5704	0.4756	0.5579
3	113	24.89%	0.2100	0.1831	0.2201	0.1848	0.2020	0.5734	0.4795	0.5613
4	25	5.51%	0.2103	0.1790	0.2170	0.1902	0.2036	0.5744	0.4812	0.5624
5	9	1.98%	0.1583	0.1007	0.2374	0.2518	0.2518	0.6047	0.5143	0.5951
4 + 5	34	-	0.1980	0.1604	0.2218	0.2048	0.2150	0.5816	0.4891	0.5702

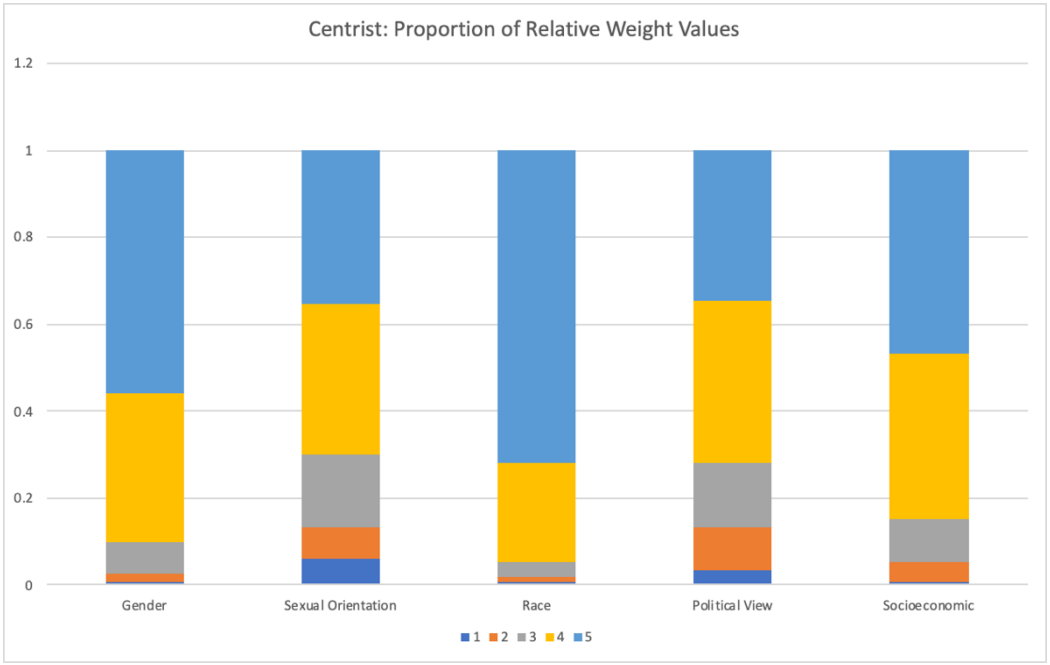
Table 15: Alpha Values and Diversity Indices for Political View



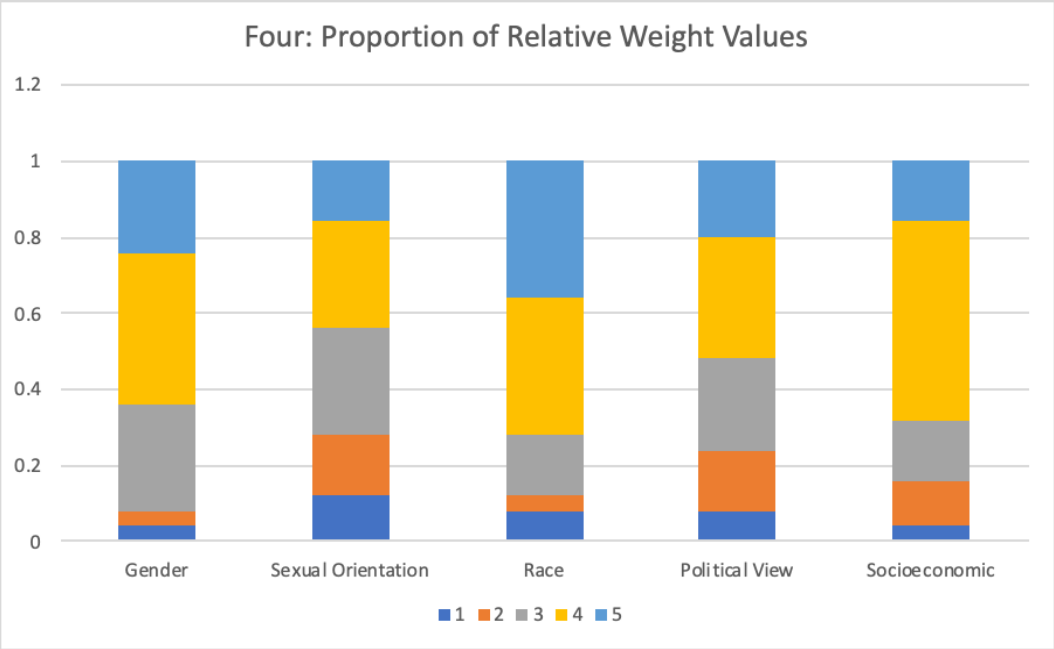
Graph 32: Progressive (Left-Leaning): Proportion of Relative Weight Values



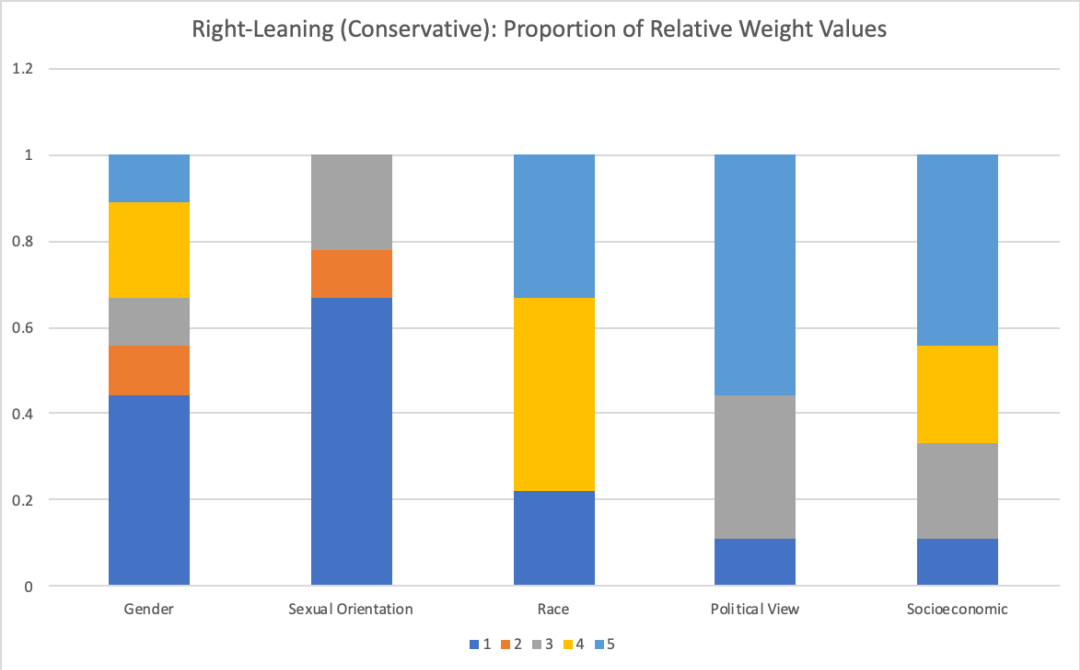
Graph 33: Two: Proportion of Relative Weight Values



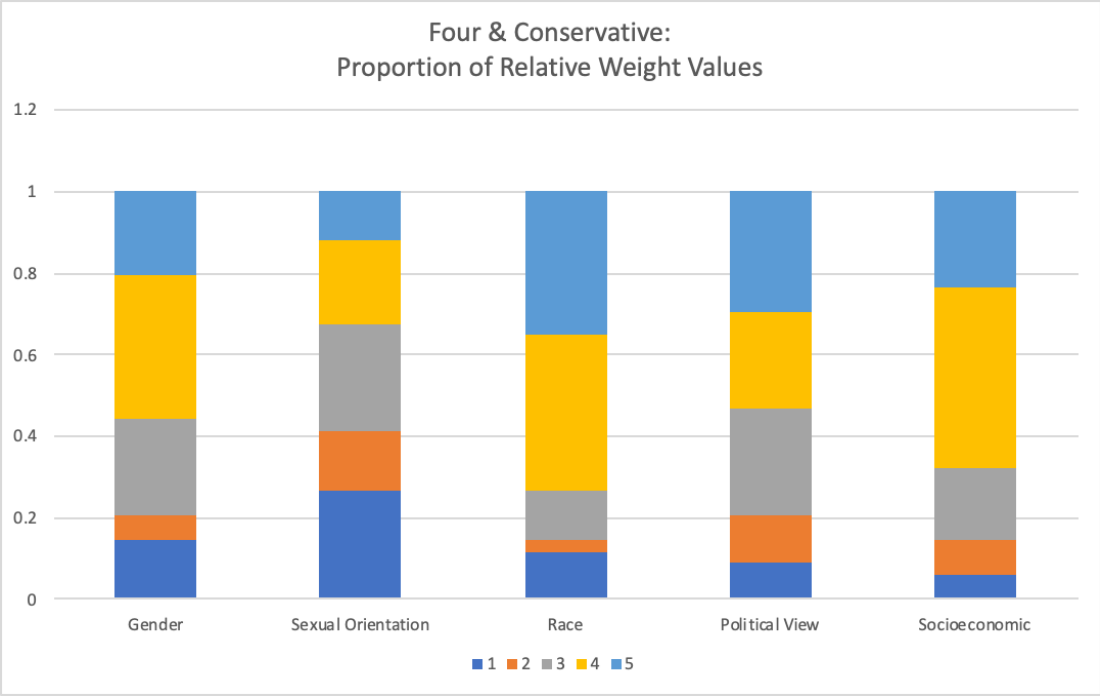
Graph 34: Centrist: Proportion of Relative Weight Values



Graph 35: Four: Proportion of Relative Weight Values



Graph 36: Right-Leaning (Conservative): Proportion of Relative Weight Values

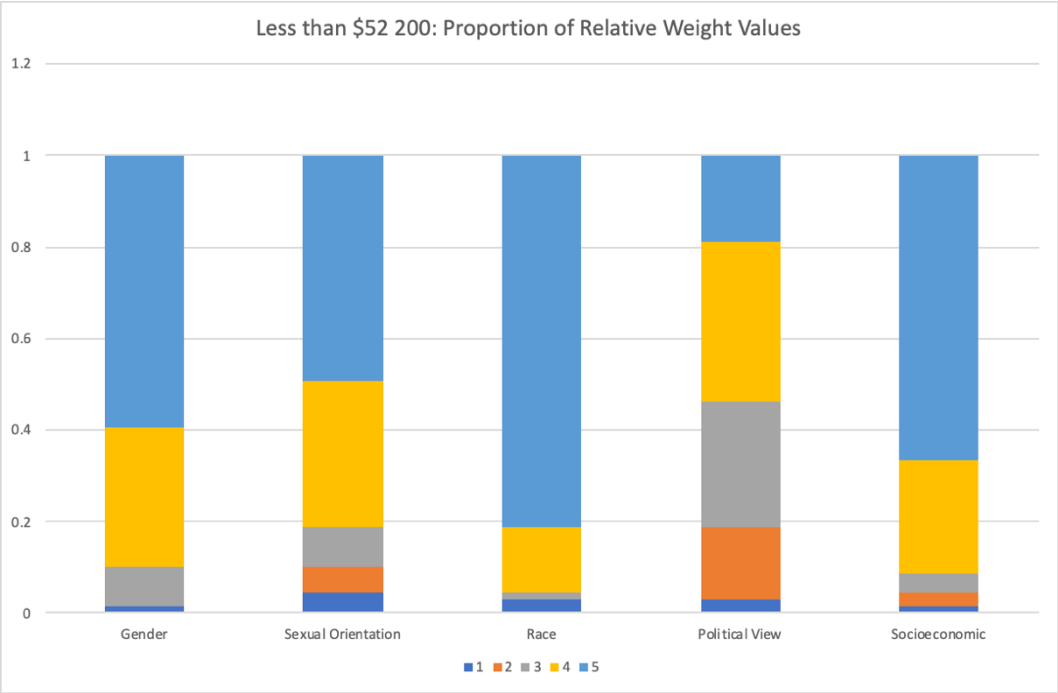


Graph 37: Conservative (4 + 5): Proportion of Relative Weight Values

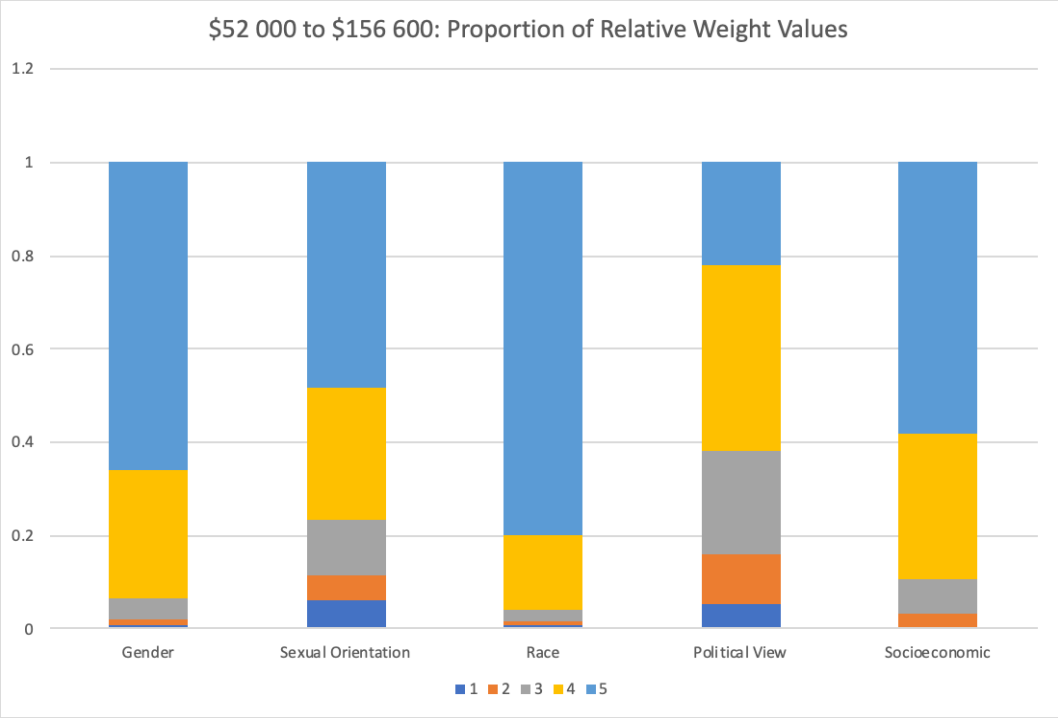
VI. Socioeconomic

SOCIO-ECONOMIC	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Lower	69	15.20%	0.2090	0.1947	0.2205	0.1642	0.2117	0.5701	0.4737	0.5572
Middle	225	49.56%	0.2128	0.1900	0.2209	0.1692	0.2072	0.5707	0.4747	0.5580
Upper	160	35.24%	0.2072	0.1936	0.2172	0.1768	0.2051	0.5710	0.4769	0.5587

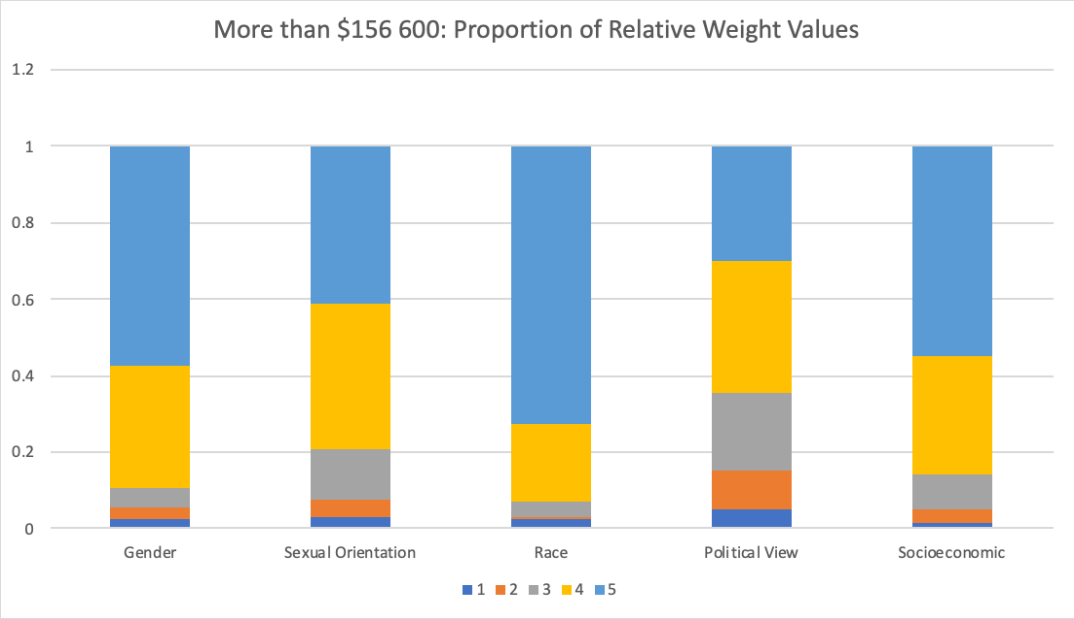
Table 16: Alpha Values and Diversity Indices for Socioeconomic



Graph 38: Lower (Less than $52 200): Proportion of Relative Weight Values



Graph 39: Middle ($52 200 to $ 156 600): Proportion of Relative Weight Values



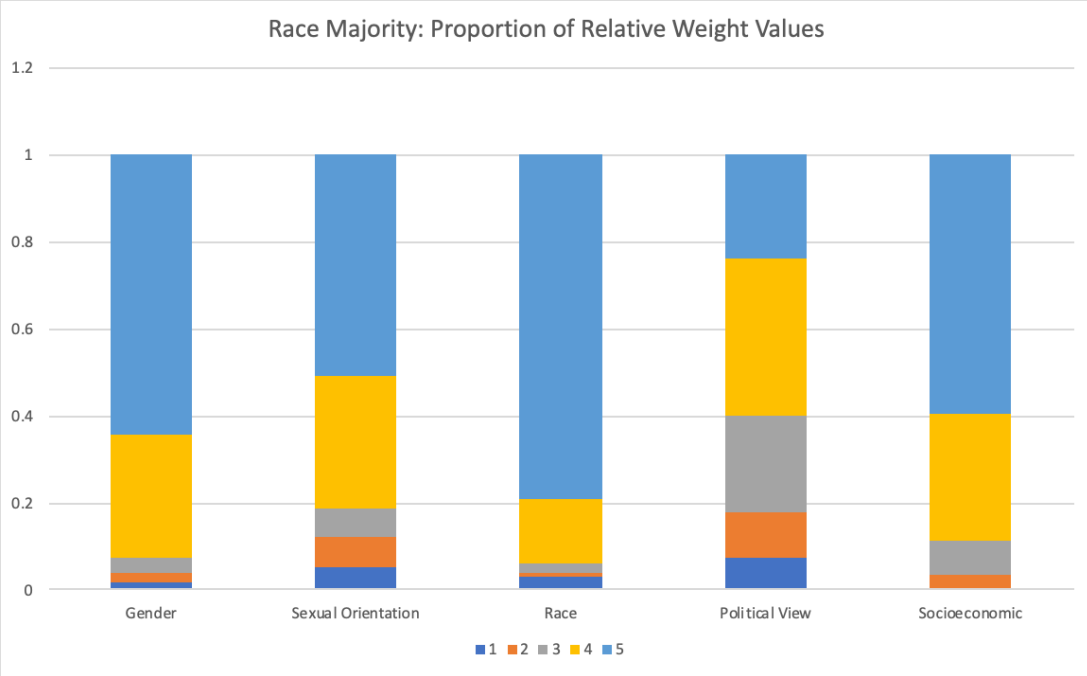
Graph 40: Upper (More than $ 156 600): Proportion of Relative Weight Values

B. Attribute Simplified

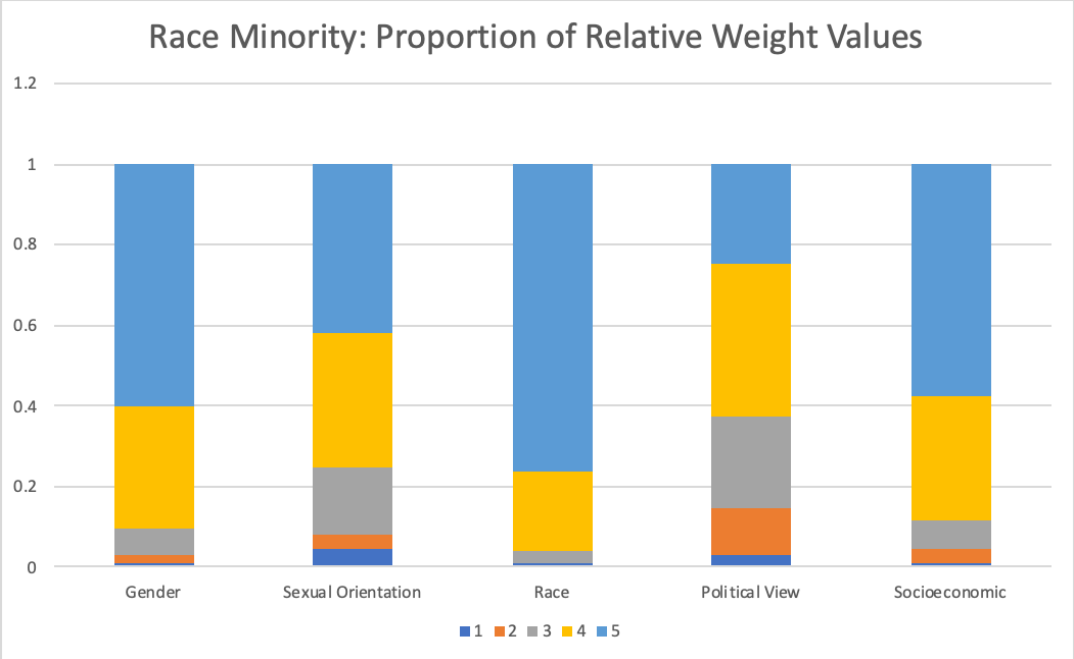
I. Race Simplified

RACE	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Majority	209	46.04%	0.2113	0.1943	0.2183	0.1681	0.2080	0.5698	0.4742	0.5571
Minority	245	53.96%	0.2093	0.1900	0.2206	0.1737	0.2064	0.5715	0.4763	0.5590

Table 17: Alpha Values and Diversity Indices for Race (simplified)



Graph 41: Race Majority: Proportion of Relative Weight Values

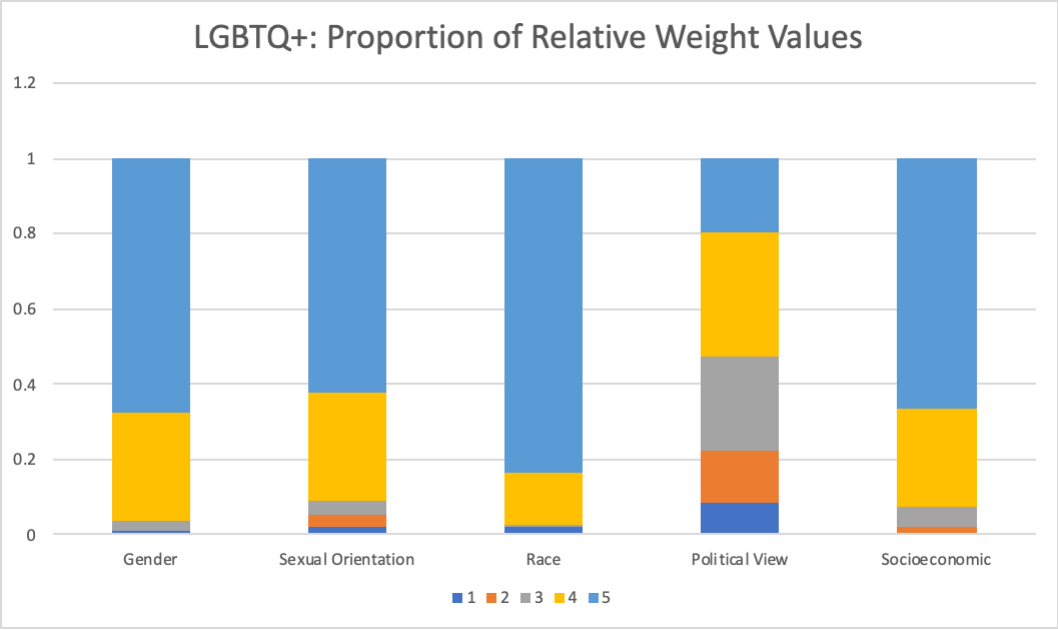


Graph 42: Race Minority: Proportion of Relative Weight Values

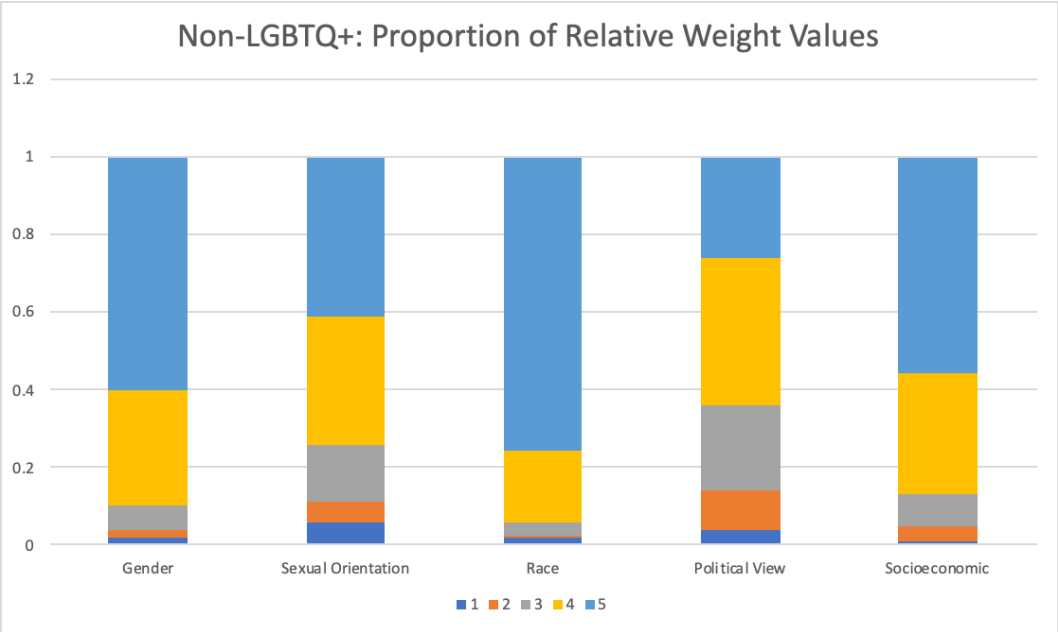
II. Sexual Orientation Simplified

LGBTQ+ vs. non-LGBTQ+	n	%	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
LGBTQ+	108	23.79%	0.2116	0.2040	0.2184	0.1565	0.2095	0.5671	0.4703	0.5540
non-LGBTQ+	346	76.21%	0.2098	0.1881	0.2199	0.1758	0.2064	0.5719	0.4769	0.5595

Table 18: Alpha Values and Diversity Indices for Sexual Orientation (simplified)



Graph 43: LGBTQ+: Proportion of Relative Weight Values



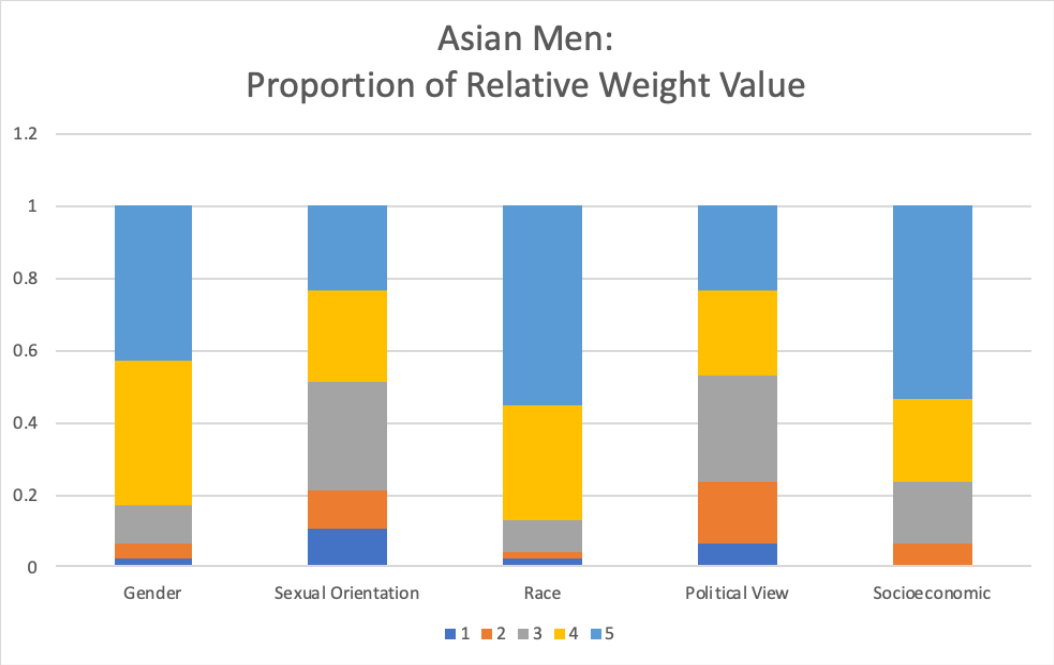
Graph 44: Non-LGBTQ+: Proportion of Relative Weight Values

C. Combination

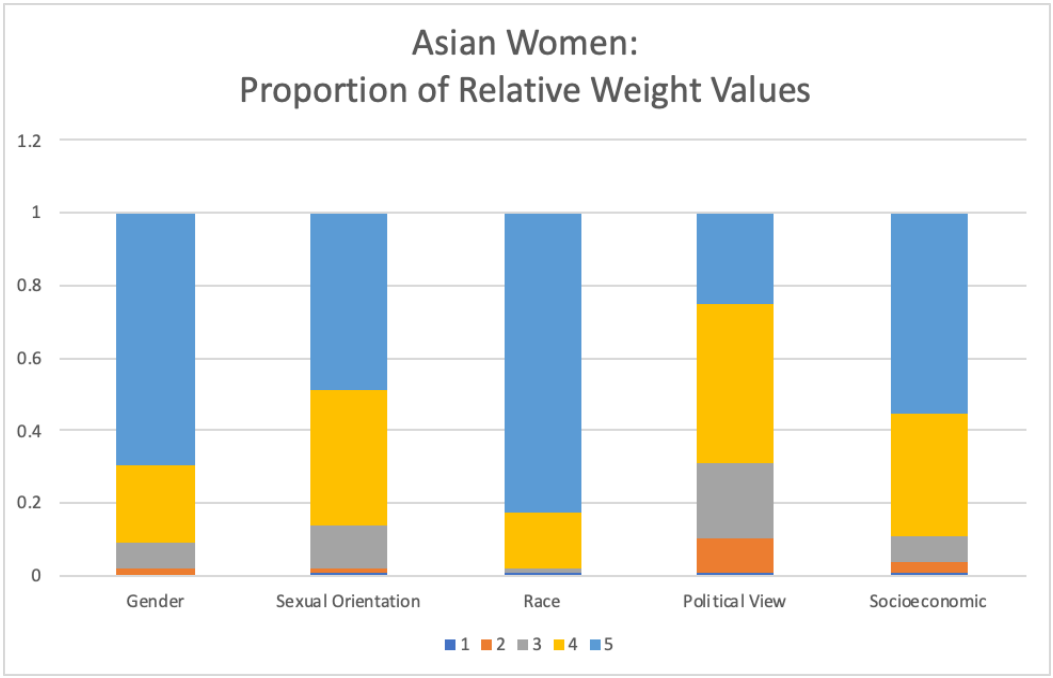
I. Race & Gender

RACE & GENDER	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Asian Men	47	0.2130	0.1739	0.2228	0.1739	0.2163	0.5746	0.4779	0.5619
Asian Women	99	0.2093	0.1969	0.2185	0.1747	0.2006	0.5699	0.4756	0.5575
Black/African American Men	8	0.2114	0.1829	0.2171	0.1829	0.2057	0.5730	0.4789	0.5608
Black/African American Women	30	0.2105	0.1842	0.2260	0.1734	0.2059	0.5728	0.4767	0.5604
White Men	60	0.2107	0.1868	0.2215	0.1719	0.2091	0.5719	0.4761	0.5594
White Women	143	0.2114	0.1957	0.2165	0.1698	0.2066	0.5695	0.4744	0.5568
Minority Men	176	0.2116	0.2040	0.2184	0.1565	0.2095	0.5671	0.4703	0.5540
Minority Women	67	0.2079	0.1939	0.2207	0.1730	0.2045	0.5708	0.4759	0.5584

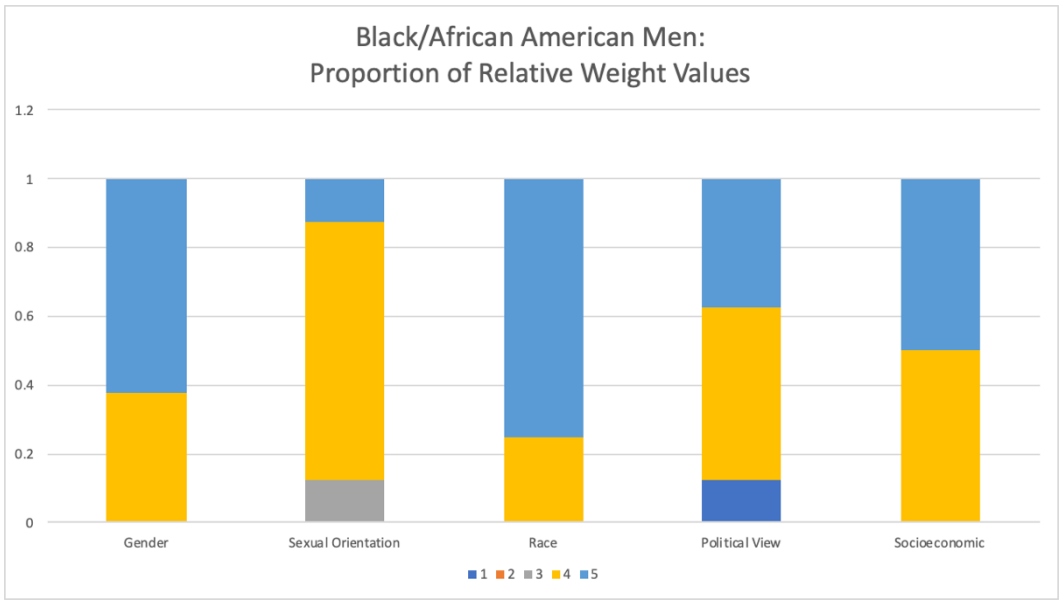
Table 19: Alpha Values and Diversity Indices for Race & Gender Combination



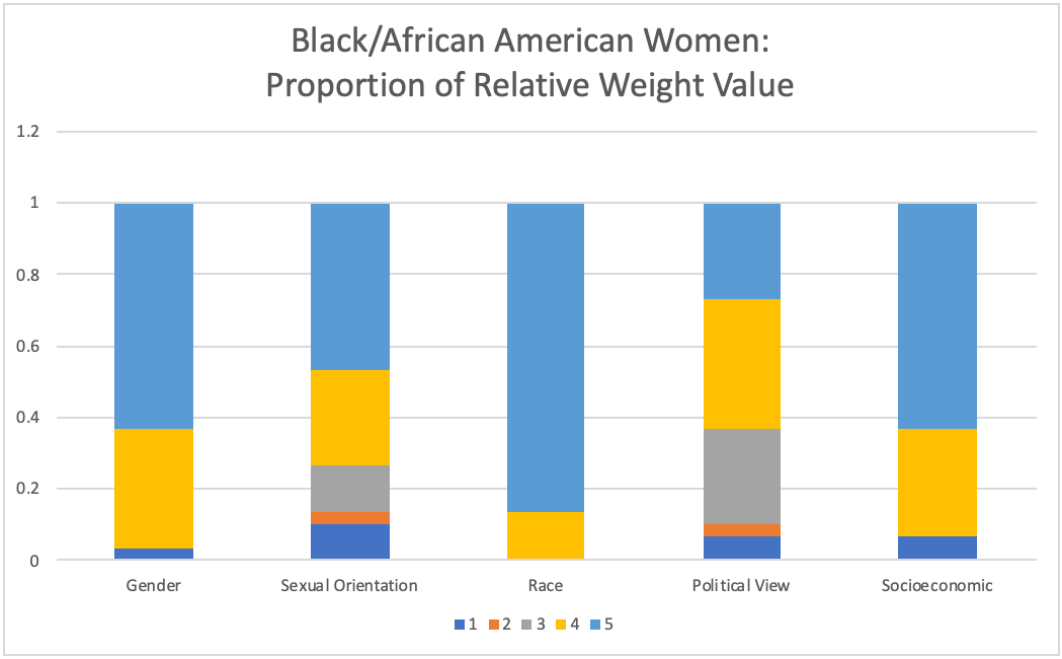
Graph 45: Asian Men: Proportion of Relative Weight Values



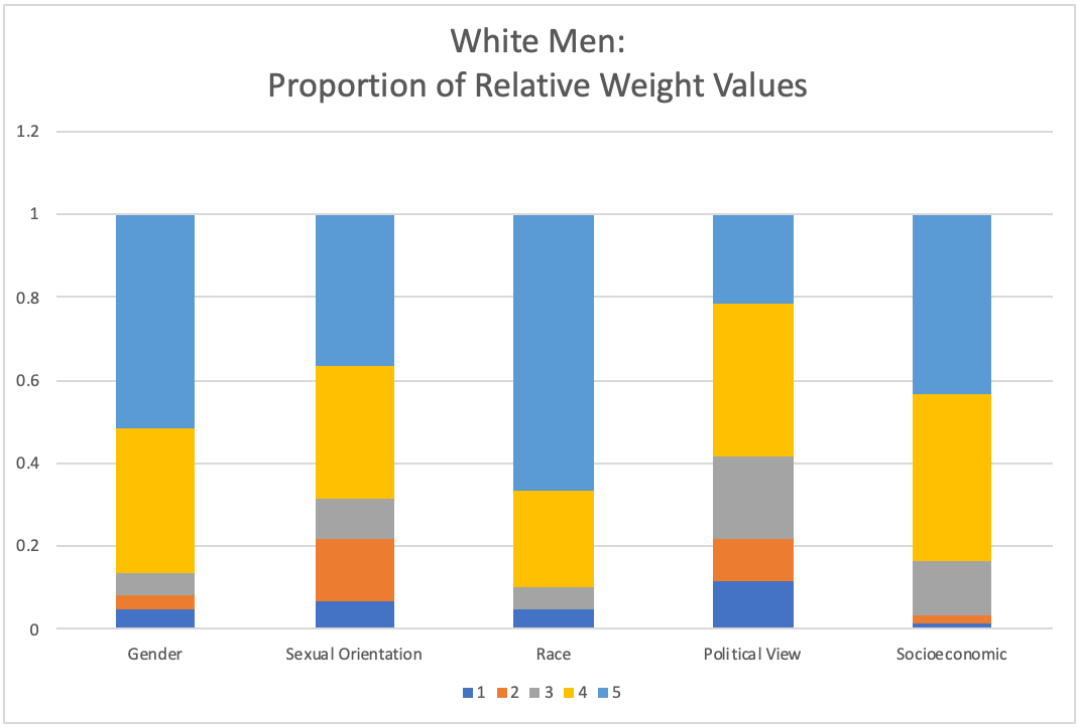
Graph 46: Asian Women: Proportion of Relative Weight Values



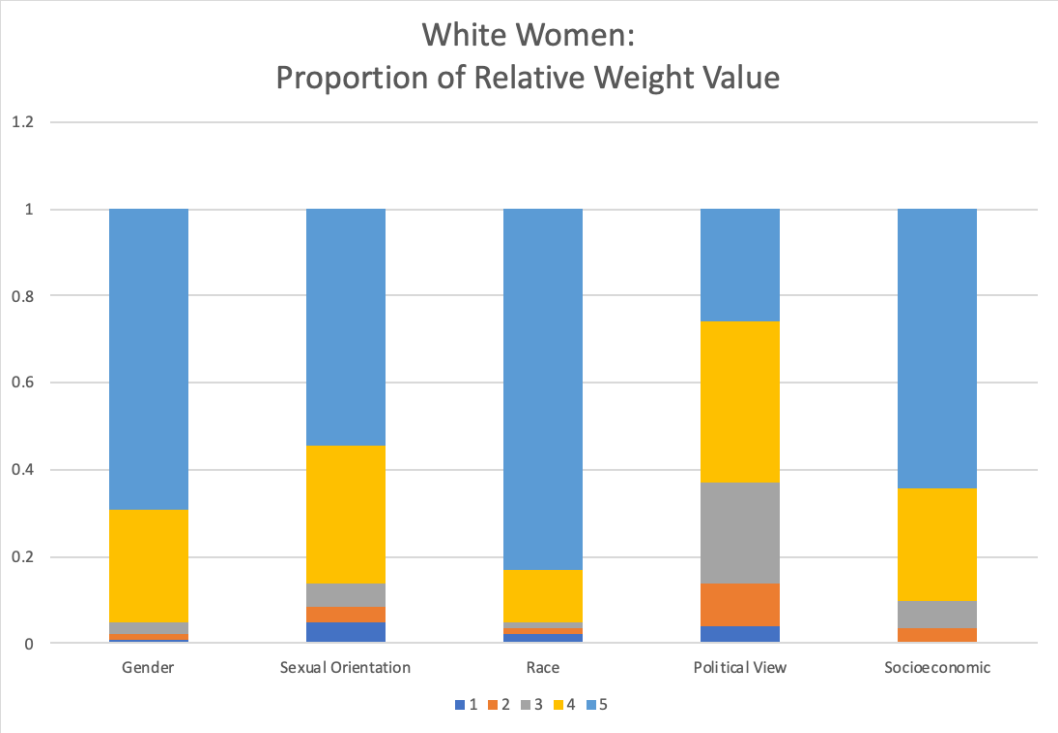
Graph 47: Black/African American Men: Proportion of Relative Weight Values



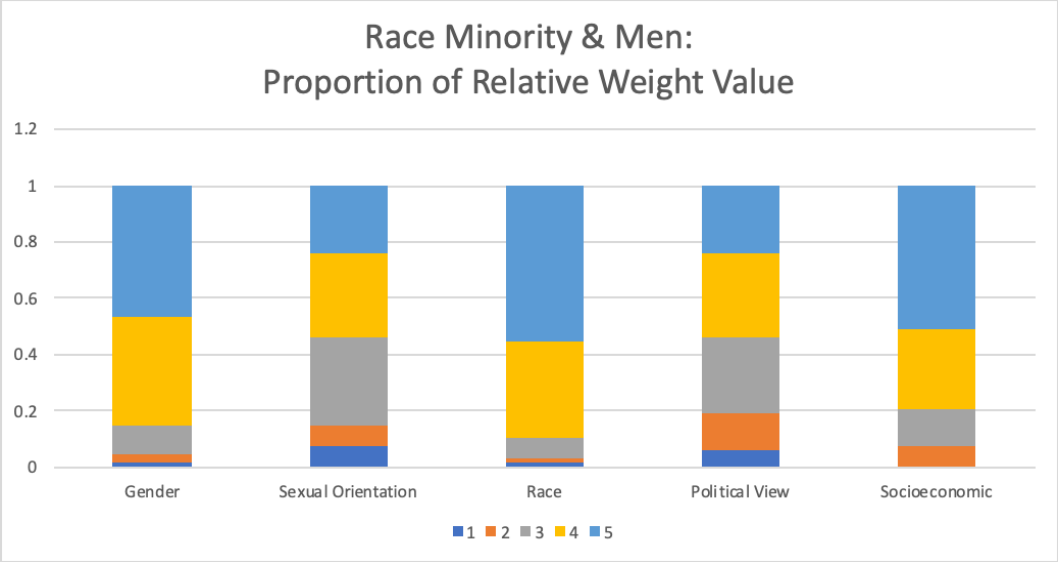
Graph 48: Black/African American Women: Proportion of Relative Weight Values



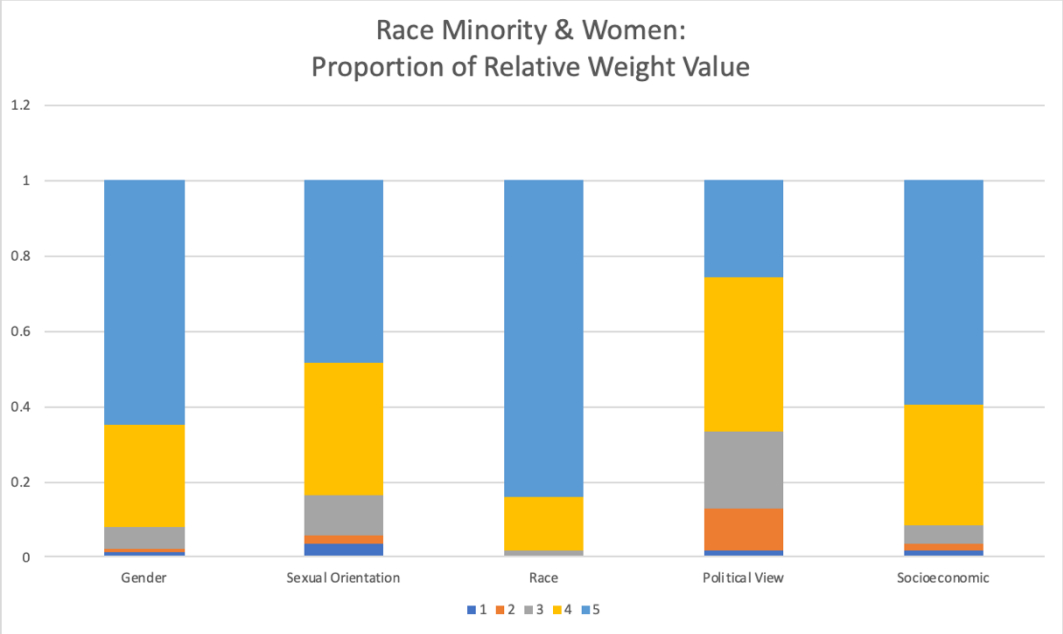
Graph 49: White Men: Proportion of Relative Weight Values



Graph 50: White Women: Proportion of Relative Weight Values



Graph 51: Race Minority & Men: Proportion of Relative Weight Values

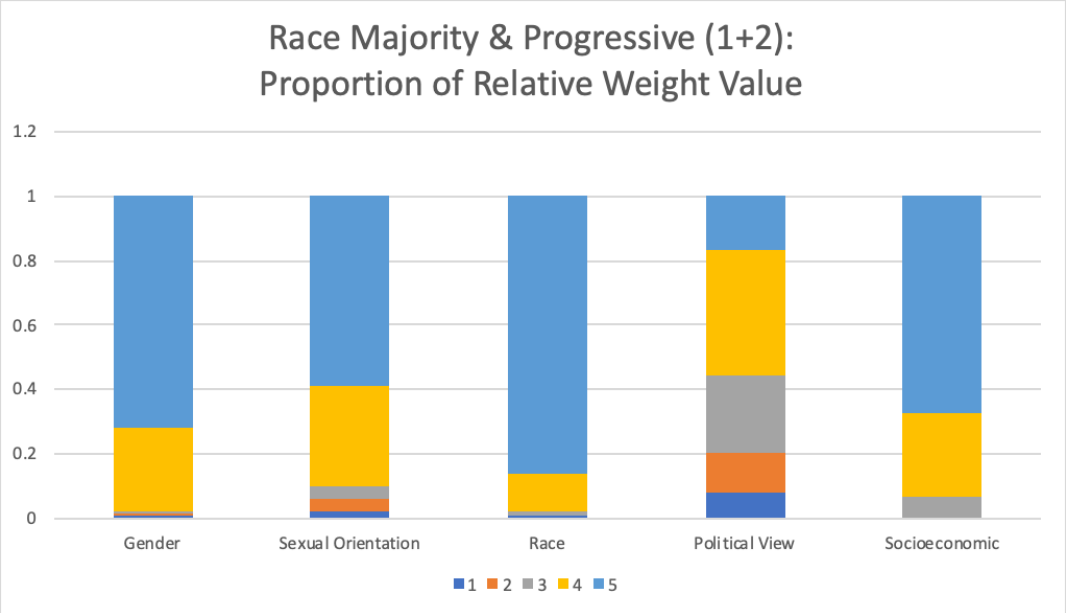


Graph 52: Race Minority & Women: Proportion of Relative Weight Values

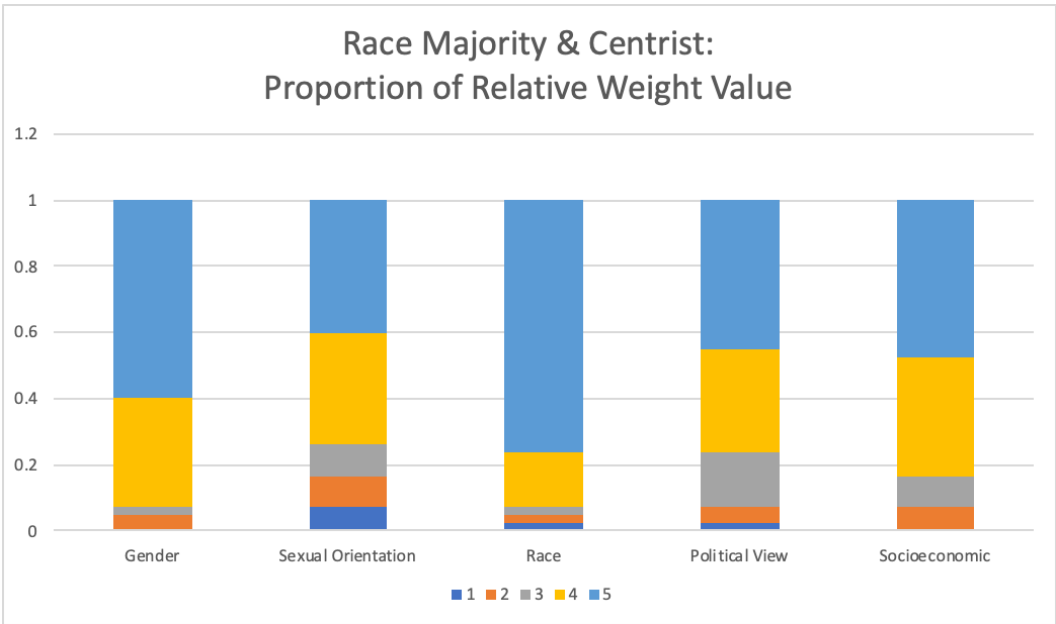
II. Race & Political View

RACE & POLITICAL VIEW	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Majority Progressive	148	0.2129	0.2006	0.2200	0.1566	0.2098	0.5677	0.4705	0.5546
Majority Centrist	42	0.2096	0.1828	0.2163	0.1929	0.2159	0.5737	0.4814	0.5619
Majority Conservative	19	0.2096	0.1828	0.2163	0.1929	0.2159	0.5737	0.4814	0.5619
Minority Progressive	159	0.2100	0.1953	0.2183	0.1696	0.2068	0.5699	0.4746	0.5573
Minority Centrist	71	0.2102	0.1833	0.2224	0.1799	0.2042	0.5732	0.4784	0.5609
Minority Conservative	15	0.1956	0.1587	0.2399	0.1919	0.2140	0.5826	0.4867	0.5710

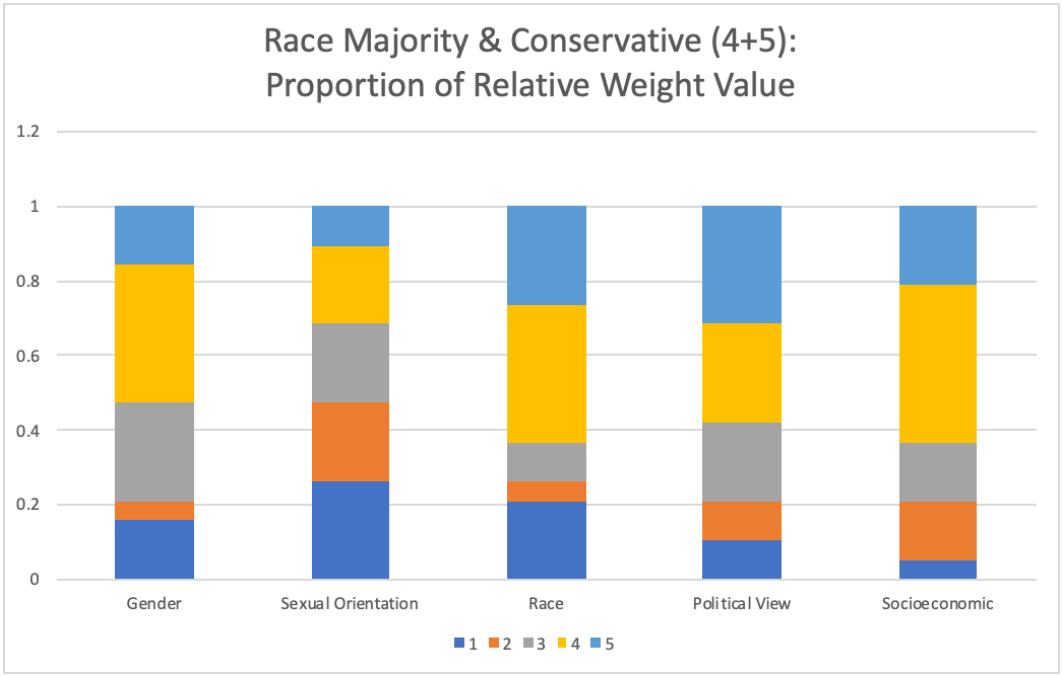
Table 20: Alpha Values and Diversity Indices for Race & Political View Combination



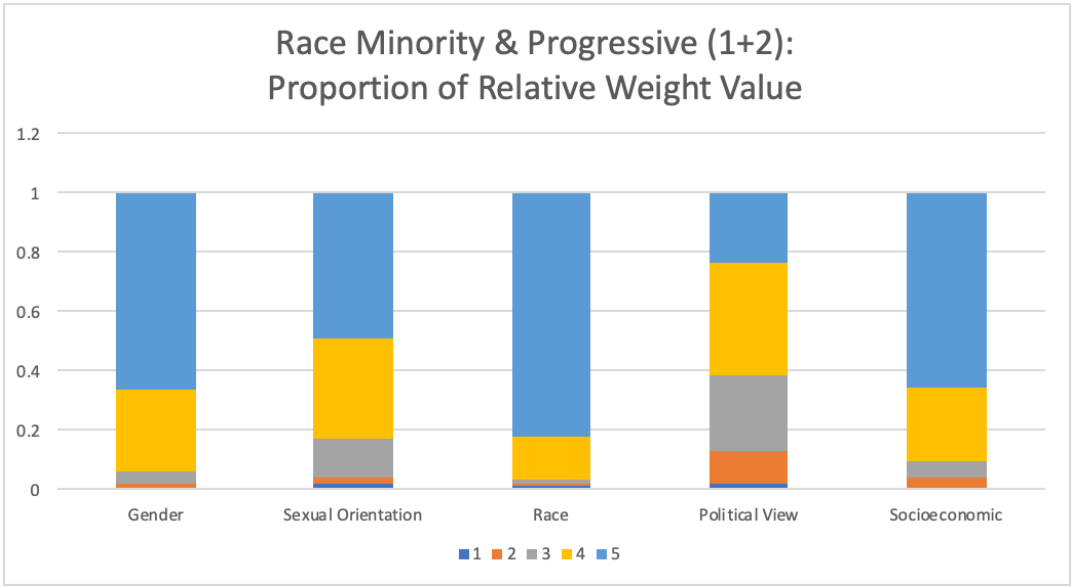
Graph 53: Race Majority & Progressive (1 + 2): Proportion of Relative Weight Values



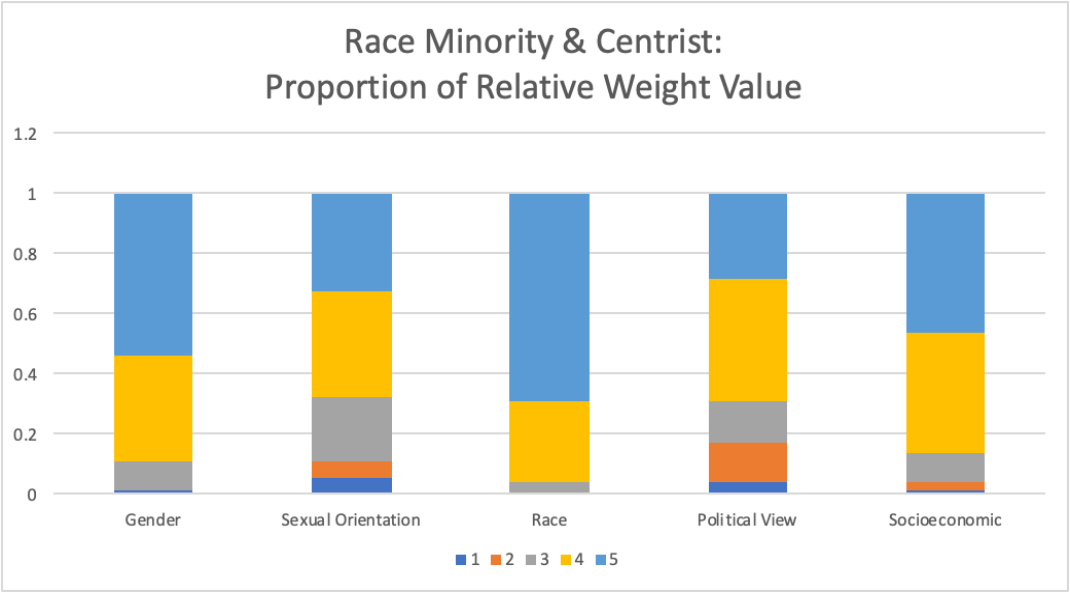
Graph 54: Race Majority & Centrist: Proportion of Relative Weight Values



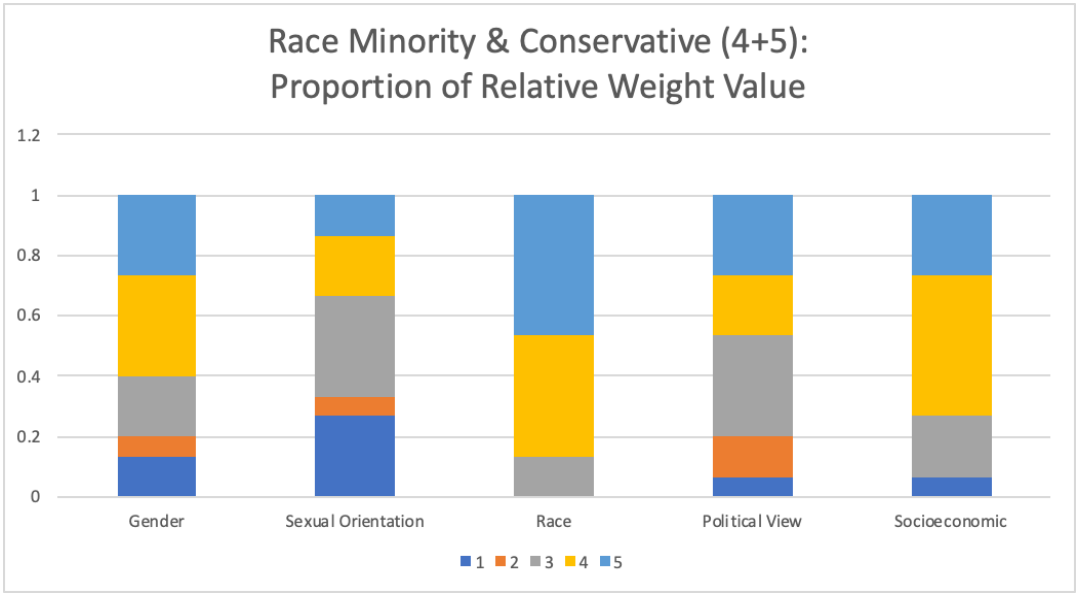
Graph 55: Race Majority & Conservative (4 + 5): Proportion of Relative Weight Values



Graph 56: Race Minority & Progressive (1 + 2): Proportion of Relative Weight Values



Graph 57: Race Minority & Centrist: Proportion of Relative Weight Values

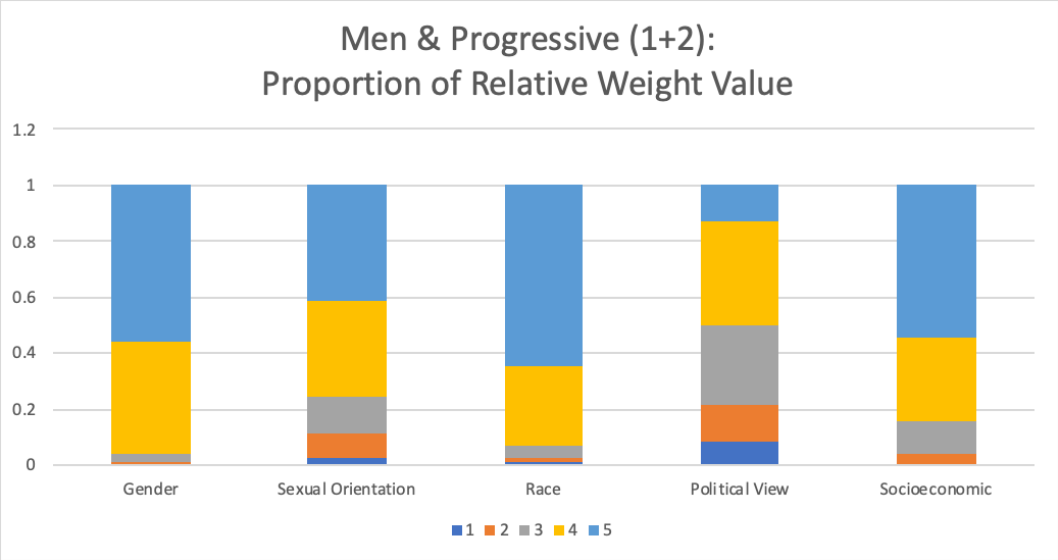


Graph 58: Race Minority & Conservative (4 + 5): Proportion of Relative Weight Values

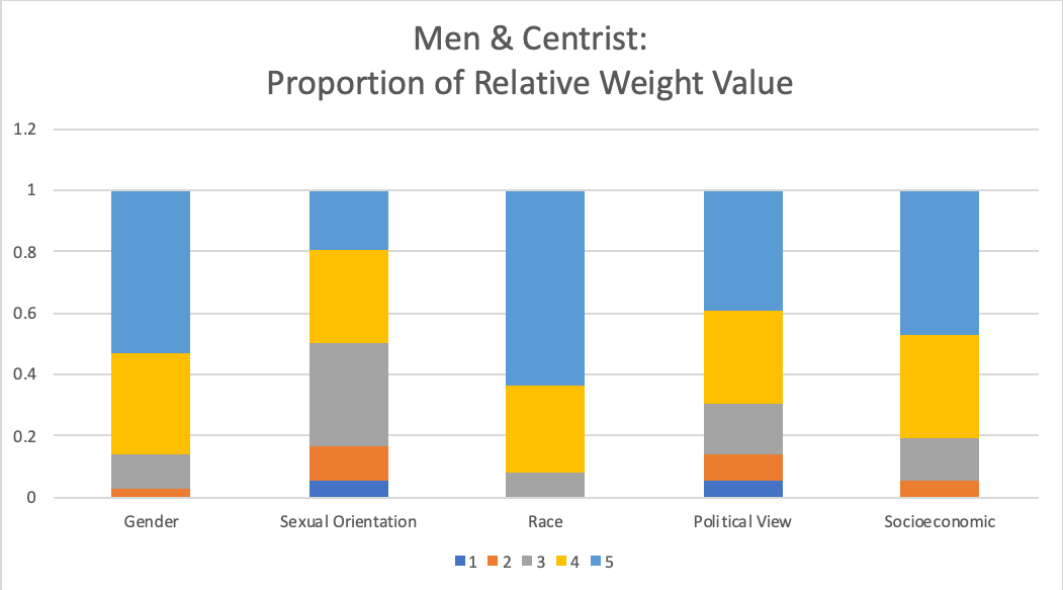
III. Gender & Political View

GENDER & POLITICAL VIEW	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Men Progressive	70	0.2171	0.1943	0.2185	0.1606	0.2095	0.5685	0.4715	0.5554
Men Centrist	36	0.2127	0.1694	0.2222	0.1897	0.2060	0.5764	0.4819	0.5643
Men Conservative	21	0.1899	0.1592	0.2291	0.1983	0.2235	0.5833	0.4892	0.5718
Women Progressive	229	0.2097	0.1979	0.2191	0.1660	0.2073	0.5692	0.4735	0.5565
Women Centrist	77	0.2088	0.1893	0.2191	0.1826	0.2002	0.5721	0.4784	0.5600
Women Conservative	13	0.2105	0.1623	0.2105	0.2149	0.2018	0.5789	0.4889	0.5677

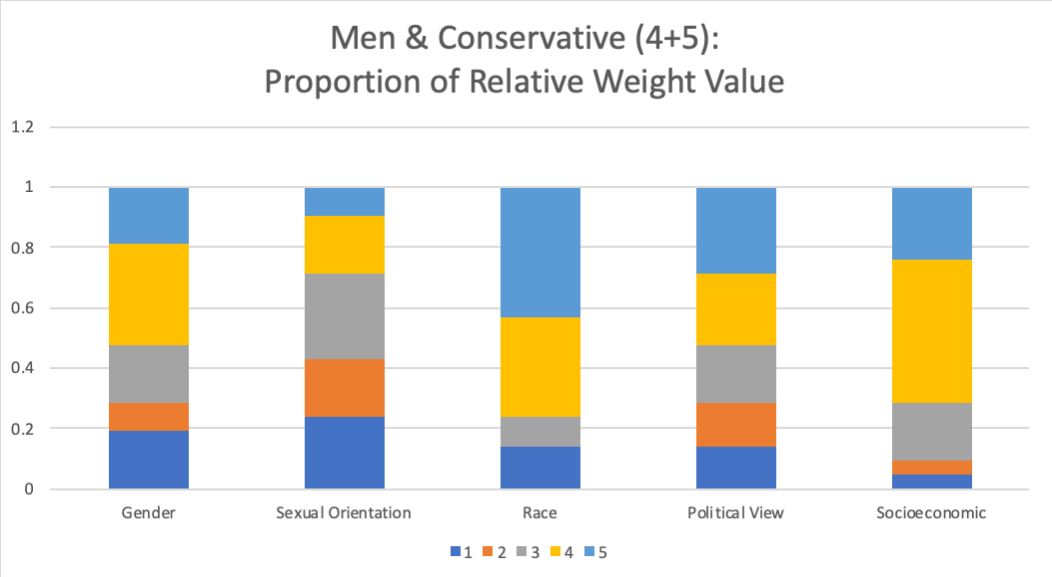
Table 21: Alpha Values and Diversity Indices for Gender & Political View Combination



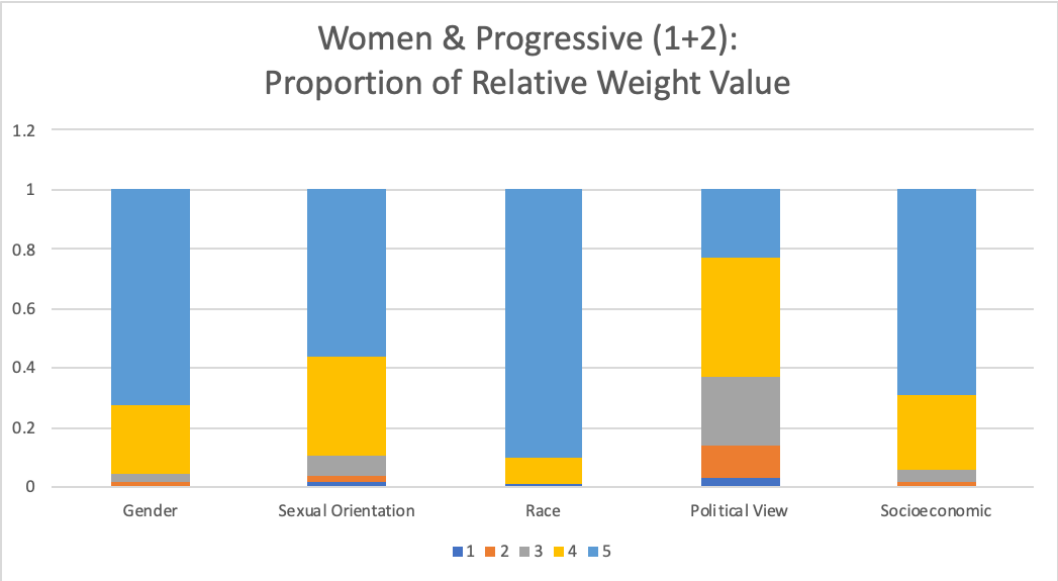
Graph 59: Men & Progressive (1 + 2): Proportion of Relative Weight Values



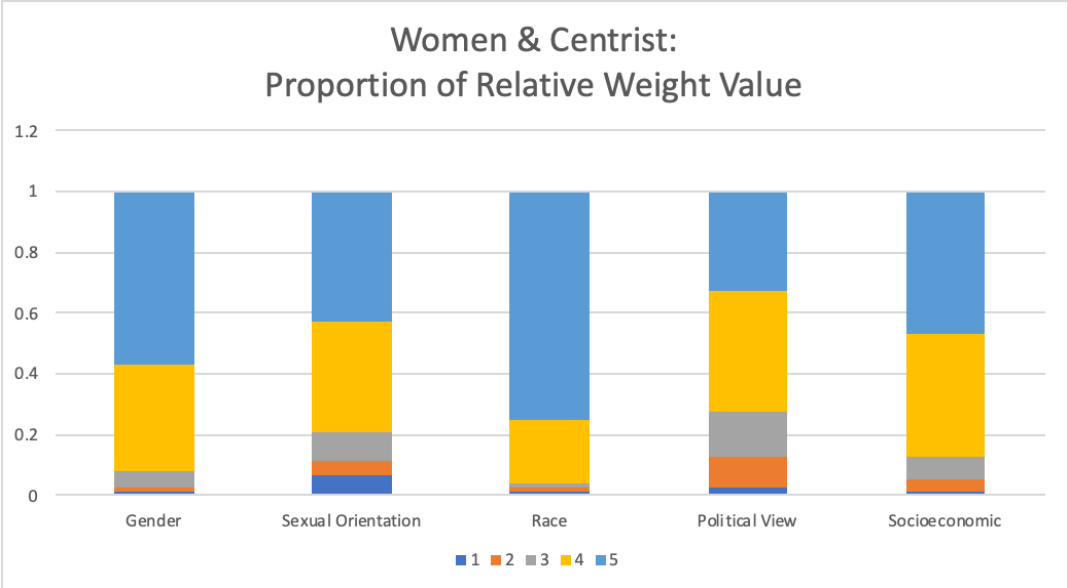
Graph 60: Men & Centrist: Proportion of Relative Weight Values



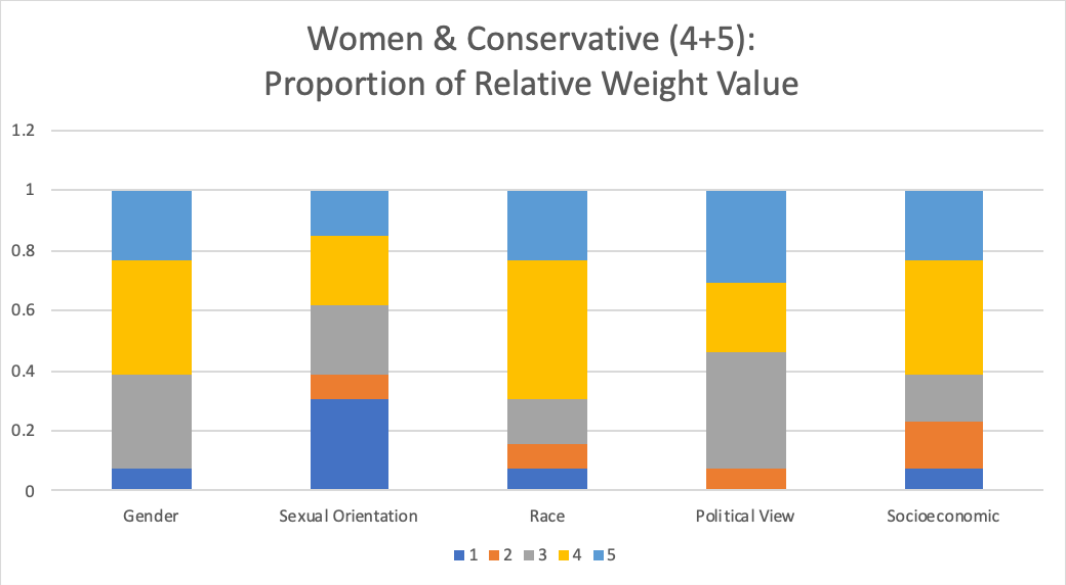
Graph 61: Men & Conservative (4 + 5): Proportion of Relative Weight Values



Graph 62: Women & Progressive (1 + 2): Proportion of Relative Weight Values



Graph 63: Women & Centrist: Proportion of Relative Weight Values

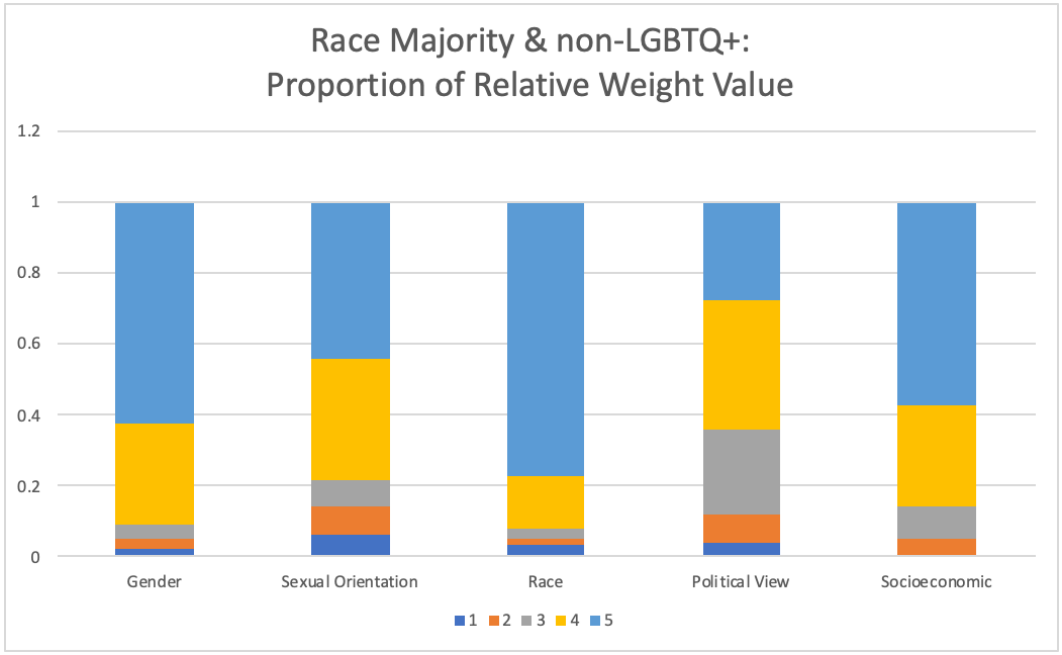


Graph 64: Women & Conservative (4 + 5): Proportion of Relative Weight Values

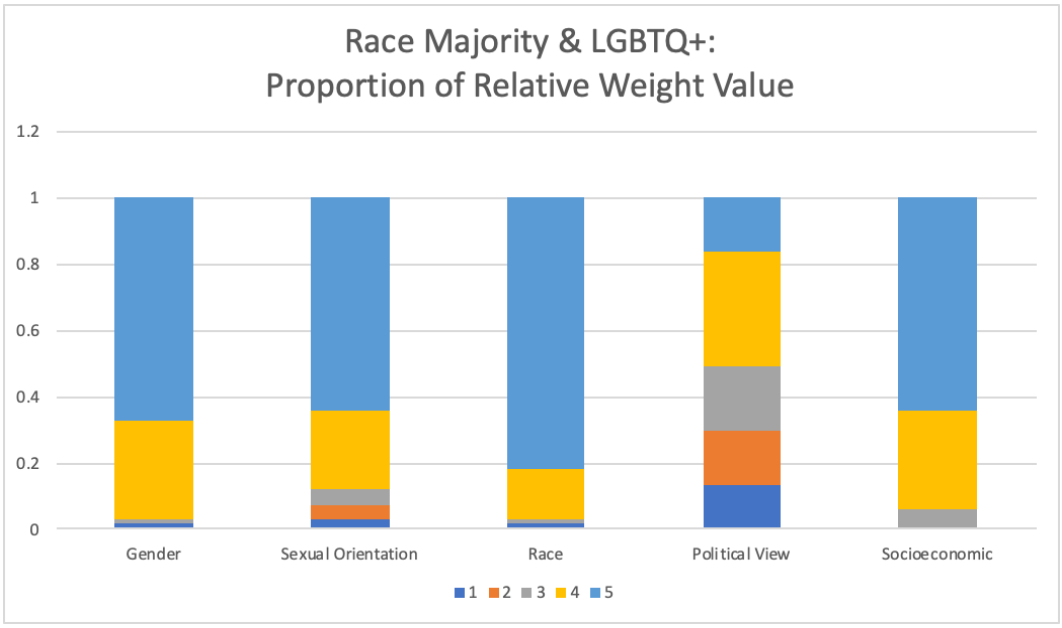
IV. Race & Sexual Orientation

RACE & SEXUAL ORIENTATION	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Majority Non-LGBTQ+	142	0.2104	0.1894	0.2173	0.1768	0.2060	0.5714	0.4769	0.5590
Majority LGBTQ+	67	0.2134	0.2044	0.2203	0.1499	0.2120	0.5665	0.4685	0.5531
Minority Non-LGBTQ+	204	0.2094	0.1872	0.2217	0.17509	0.2066	0.5722	0.4770	0.5598
Minority LGBTQ+	41	0.2088	0.2033	0.2154	0.1670	0.2055	0.5680	0.4732	0.5554

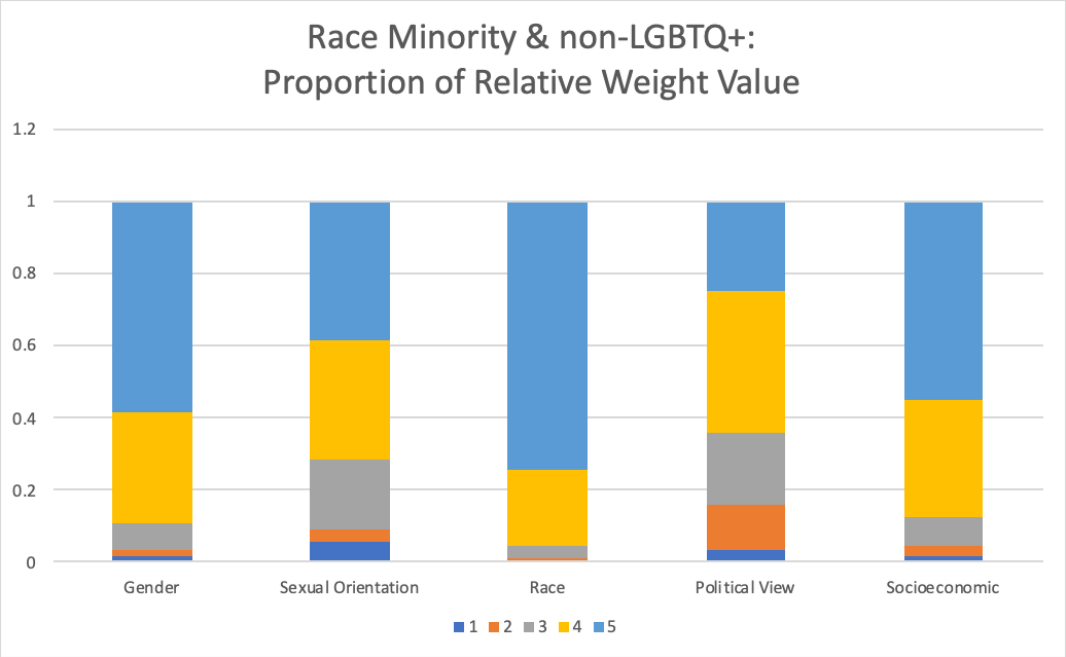
Table 22: Alpha Values and Diversity Indices for Race & Sexual Orientation Combination



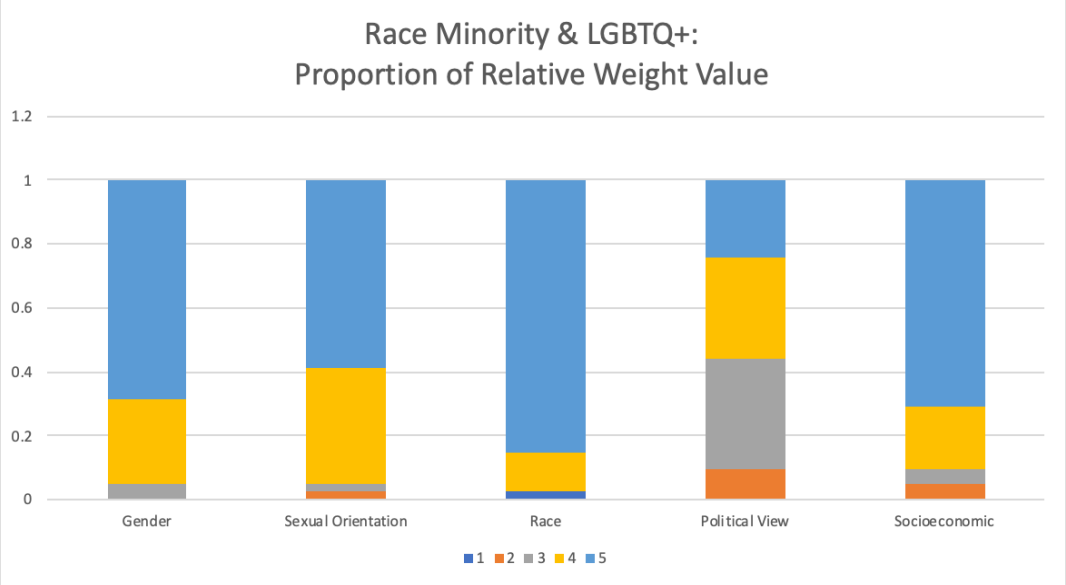
Graph 65: Race Majority & Non-LGBTQ+: Proportion of Relative Weight Values



Graph 66: Race Majority & LGBTQ+: Proportion of Relative Weight Values



Graph 67 Race Minority & Non-LGBTQ+: Proportion of Relative Weight Values

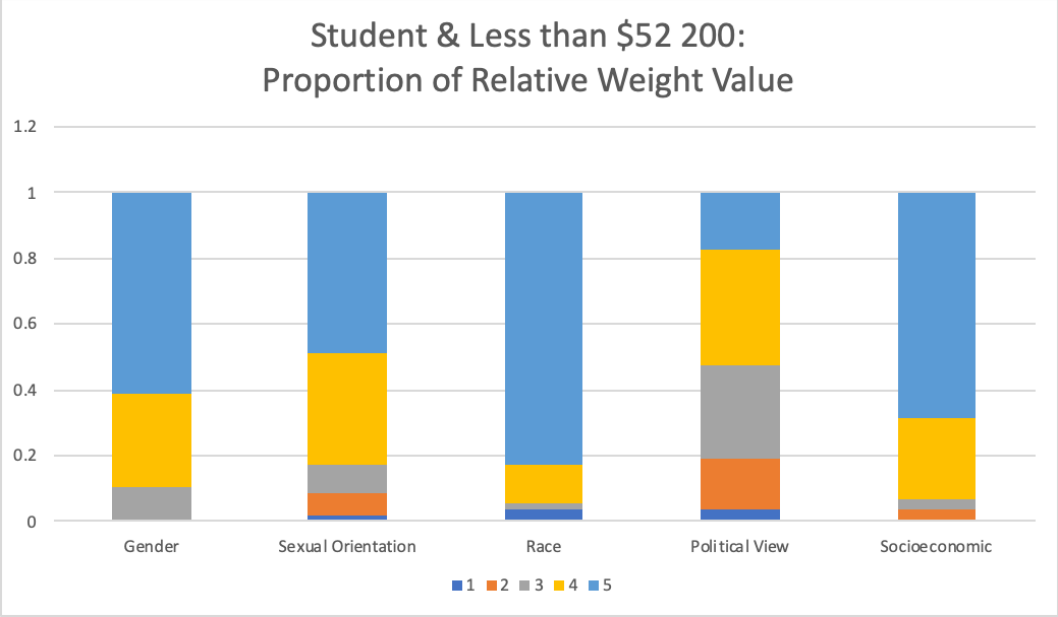


Graph 68: Race Minority & LGBTQ+: Proportion of Relative Weight Values

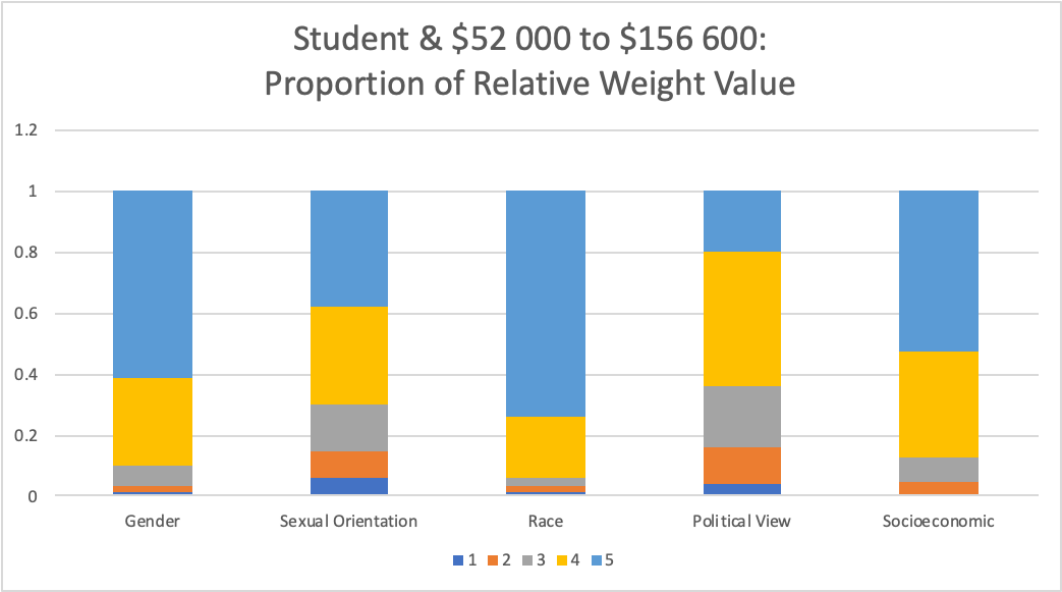
V. Title & Socioeconomic

TITLE & SOCIOECONOMIC	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Student Lower	57	0.2100	0.1961	0.2190	0.1618	0.2132	0.5694	0.4728	0.5565
Student Middle	132	0.2132	0.1847	0.2212	0.1735	0.2074	0.5720	0.4763	0.5595
Student Upper	121	0.2050	0.1929	0.2167	0.1792	0.2062	0.5716	0.4779	0.5594
Faculty/Staff/ Administrator Lower	12	0.204	0.188	0.228	0.176	0.204	0.5733	0.4779	0.5611
Faculty/Staff/ Administrator Middle	93	0.2122	0.1971	0.2204	0.1635	0.2068	0.5689	0.4726	0.5561
Faculty/Staff/ Administrator Upper	39	0.2139	0.1959	0.2188	0.1695	0.2019	0.5691	0.4738	0.5564

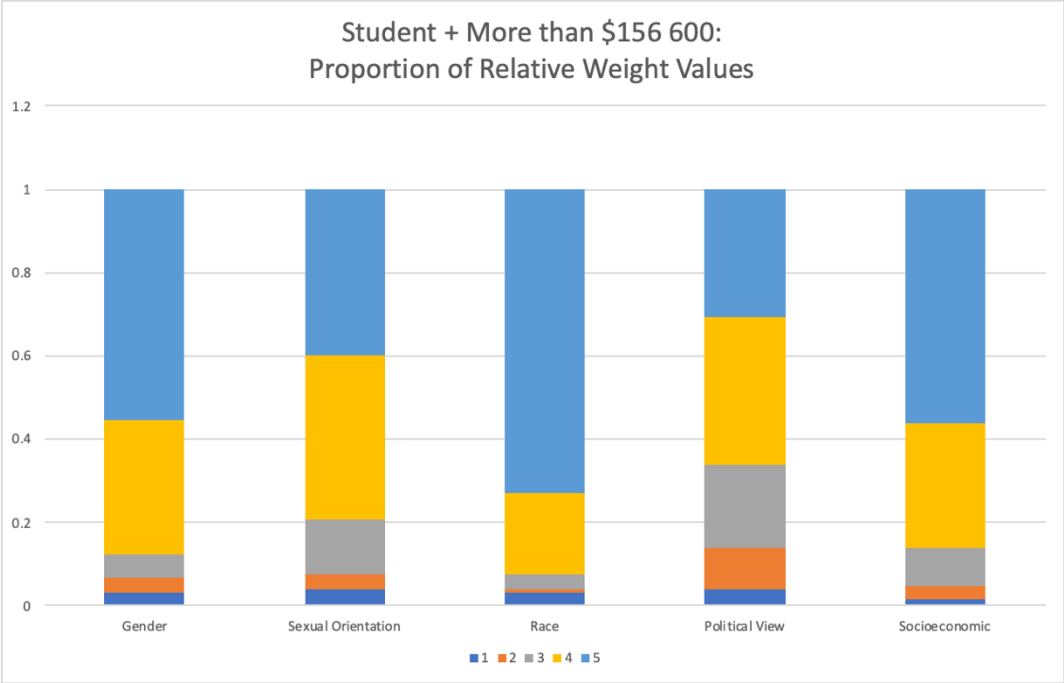
Table 23: Alpha Values and Diversity Indices for Title & Socioeconomic Combination



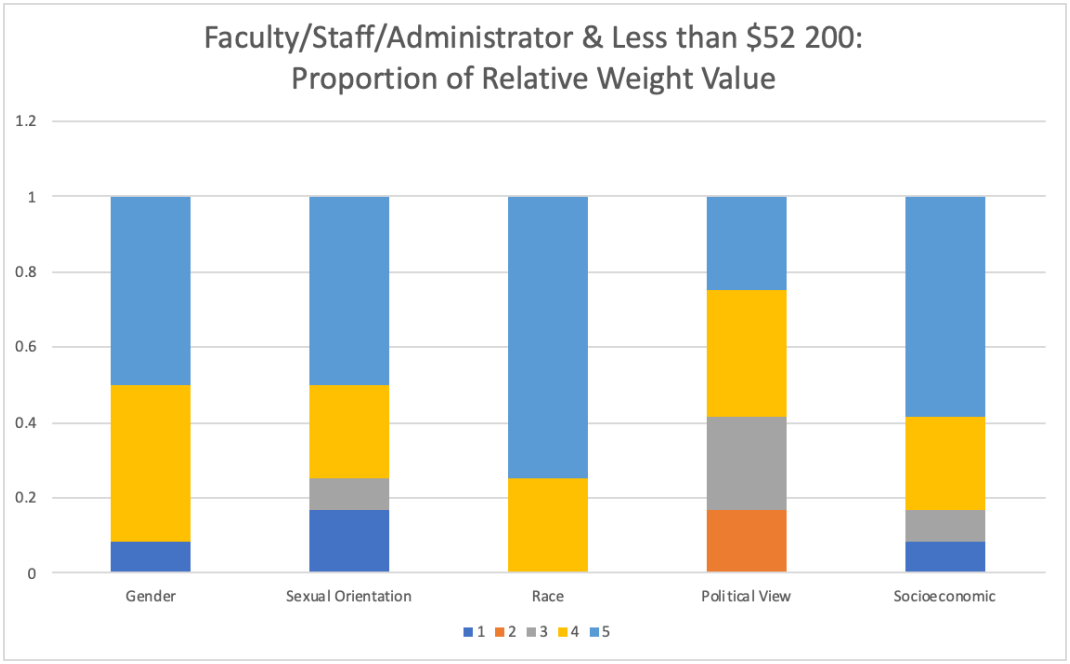
Graph 69: Student & Lower (Less than $52 200): Proportion of Relative Weight Values



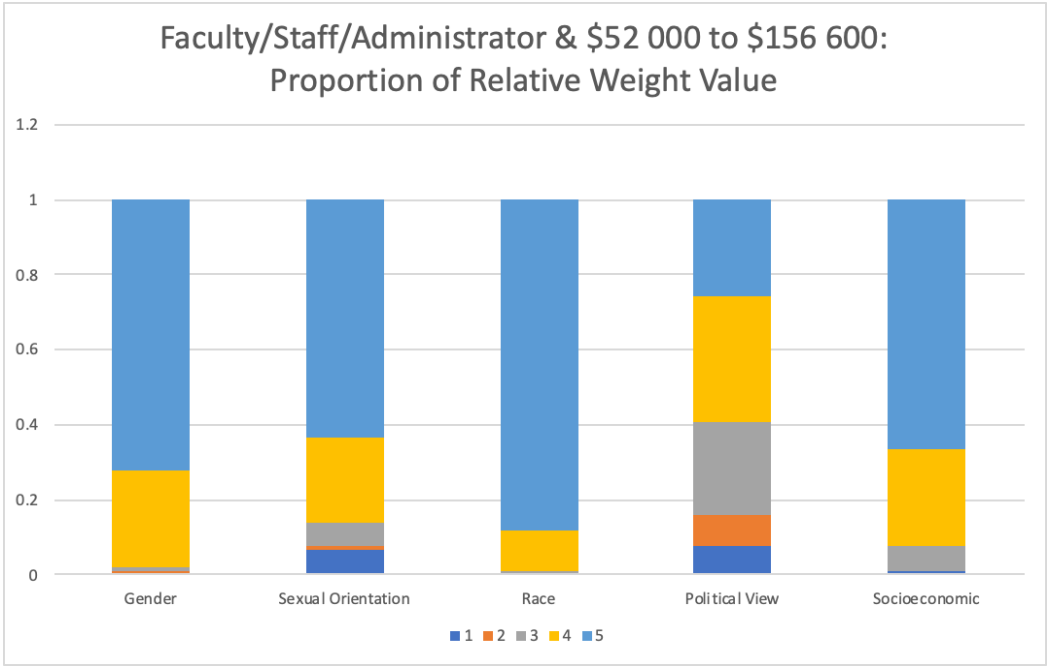
Graph 70: Student & Middle ($52 200 to $156 600): Proportion of Relative Weight Values



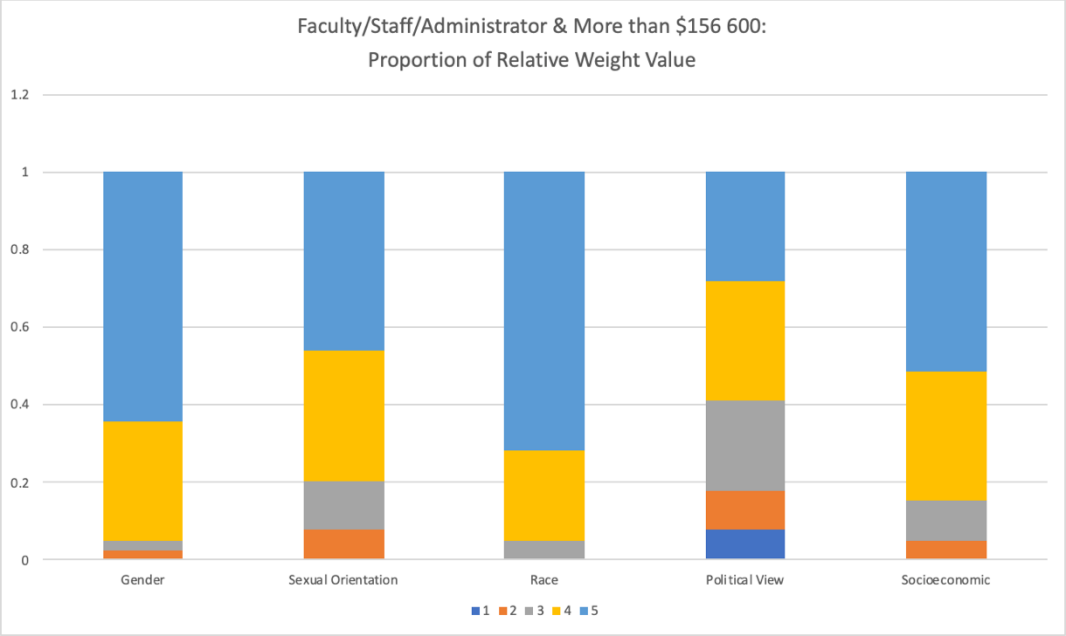
Graph 71: Student & Upper (More than $156 600): Proportion of Relative Weight Values



Graph 72: Faculty/Staff/Administrator & Lower (Less than $52 200): Proportion of Relative Weight Values



Graph 73: Faculty/Staff/Administrator & Middle ($52 200 to $156 600): Proportion of Relative Weight Values

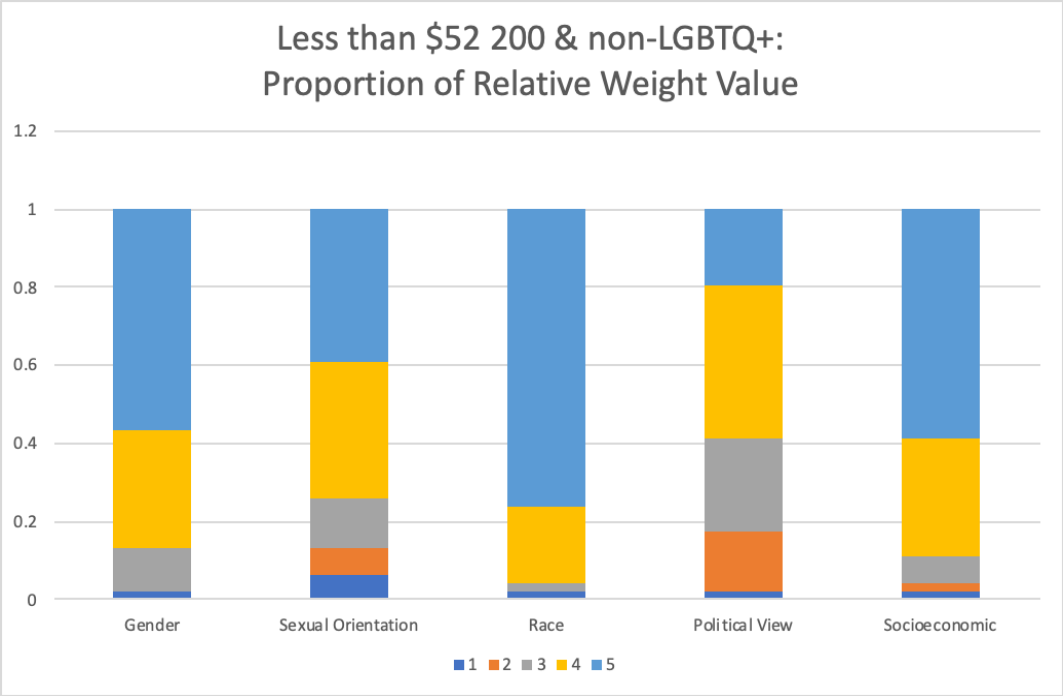


Graph 74: Faculty/Staff/Administrator & Upper (More than $156 600): Proportion of Relative Weight Values

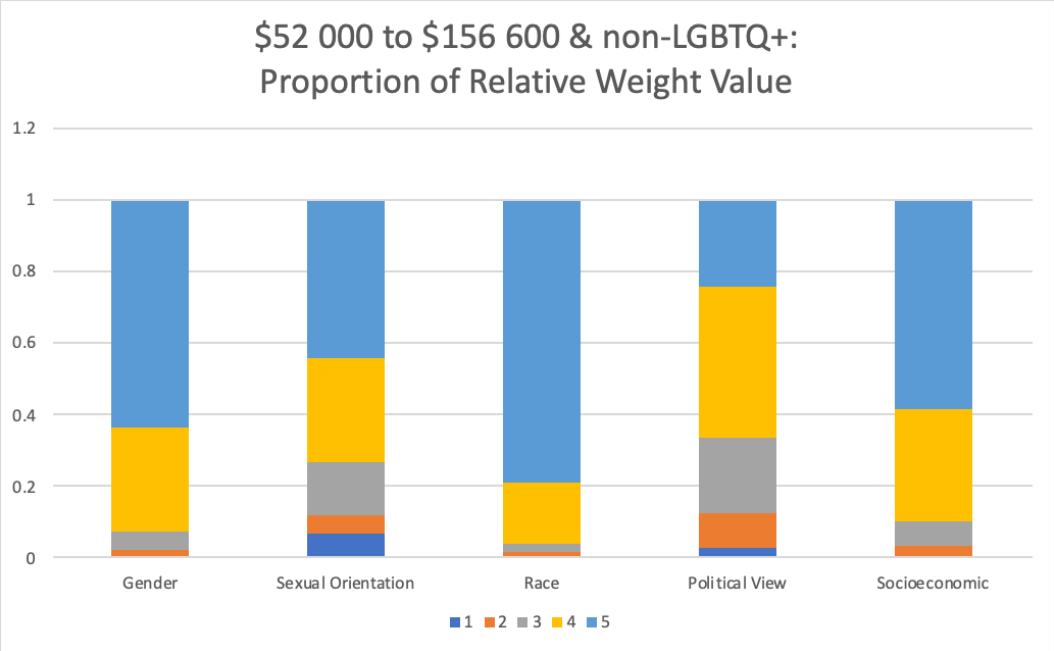
VI. Sexual Orientation & Socioeconomic

SEXUAL ORIENTATION & SOCIOECONOMIC	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Non-LGBTQ+ Lower	46	0.2091	0.1874	0.2226	0.1708	0.2101	0.5721	0.4761	0.5595
Non-LGBTQ+ Middle	172	0.2114	0.1859	0.2206	0.1750339	0.2071	0.5721	0.4768	0.5596
Non-LGBTQ+ Upper	128	0.2079	0.1914	0.2179	0.1787	0.2041	0.5715	0.4775	0.5593
LGBTQ+ Lower	23	0.2087	0.2087	0.2165	0.1516	0.2146	0.5662	0.46918	0.5530
LGBTQ+ Middle	69	0.2172	0.2032	0.2216	0.1504	0.2076	0.5662	0.4681	0.5528
LGBTQ+ Upper	32	0.2048	0.2020	0.2146	0.1697	0.2090	0.5691	0.4747	0.5566

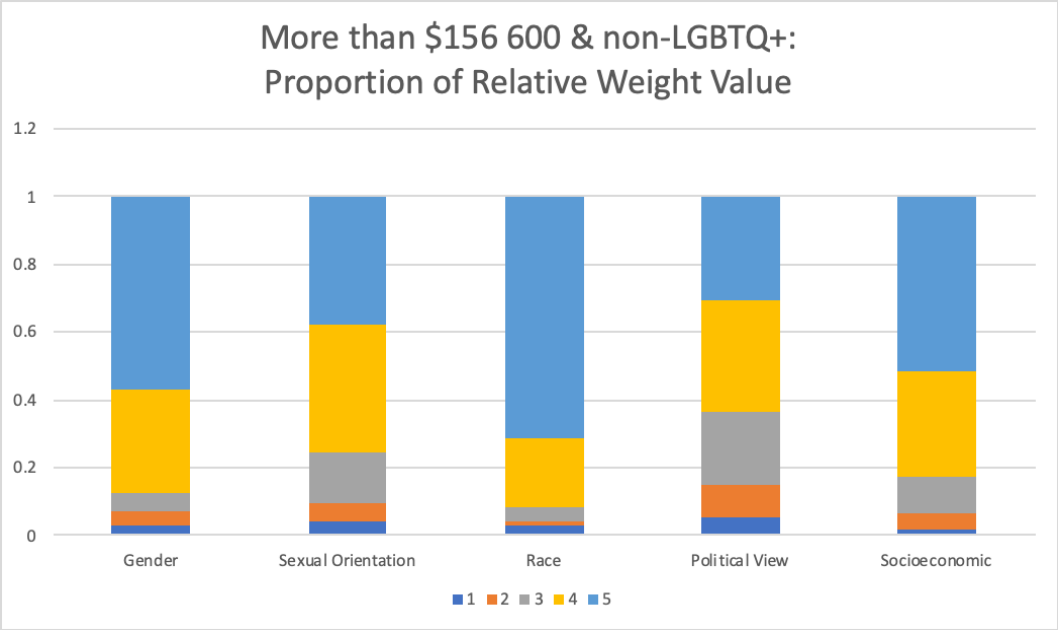
Table 24: Alpha Values and Diversity Indices for Sexual Orientation & Socioeconomic Combination



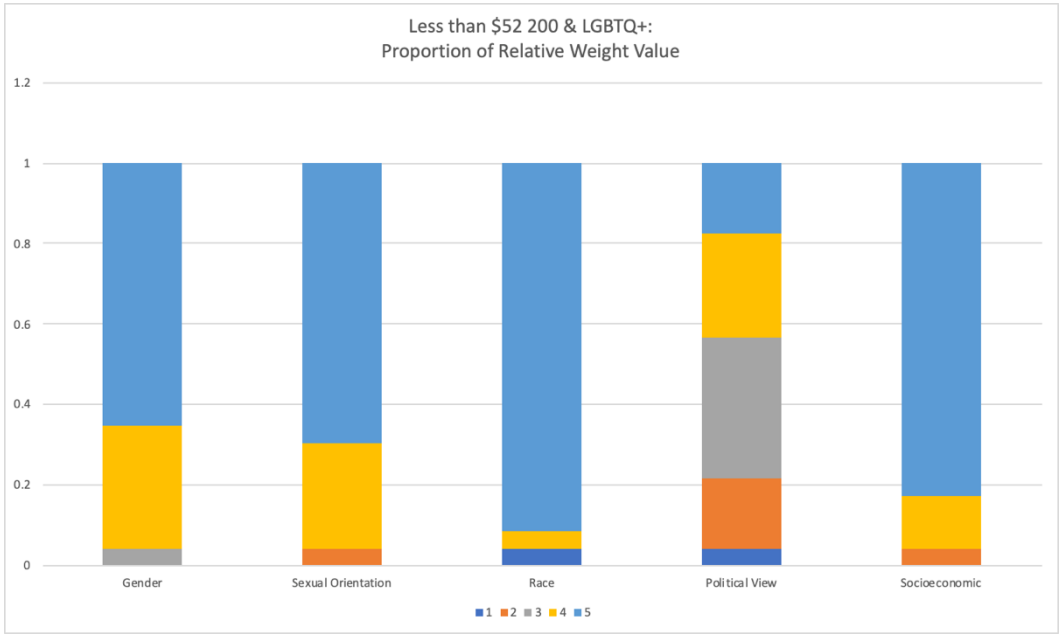
Graph 75: Non-LGBTQ+ & Lower (Less than $52 200): Proportion of Relative Weight Values



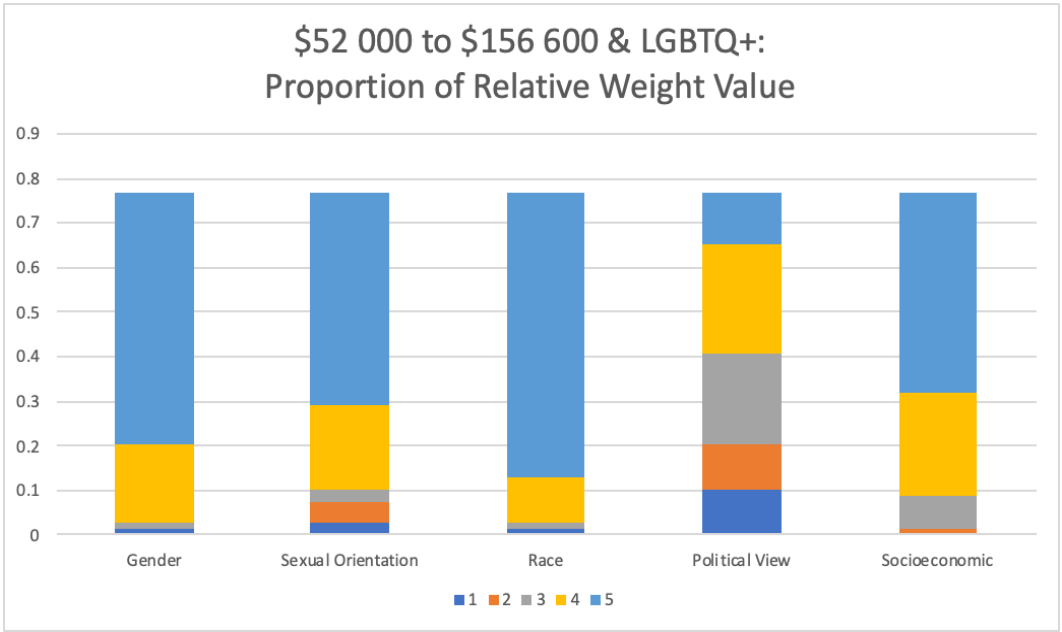
Graph 76: Non-LGBTQ+ & Middle ($52 200 to $156 600): Proportion of Relative Weight Values



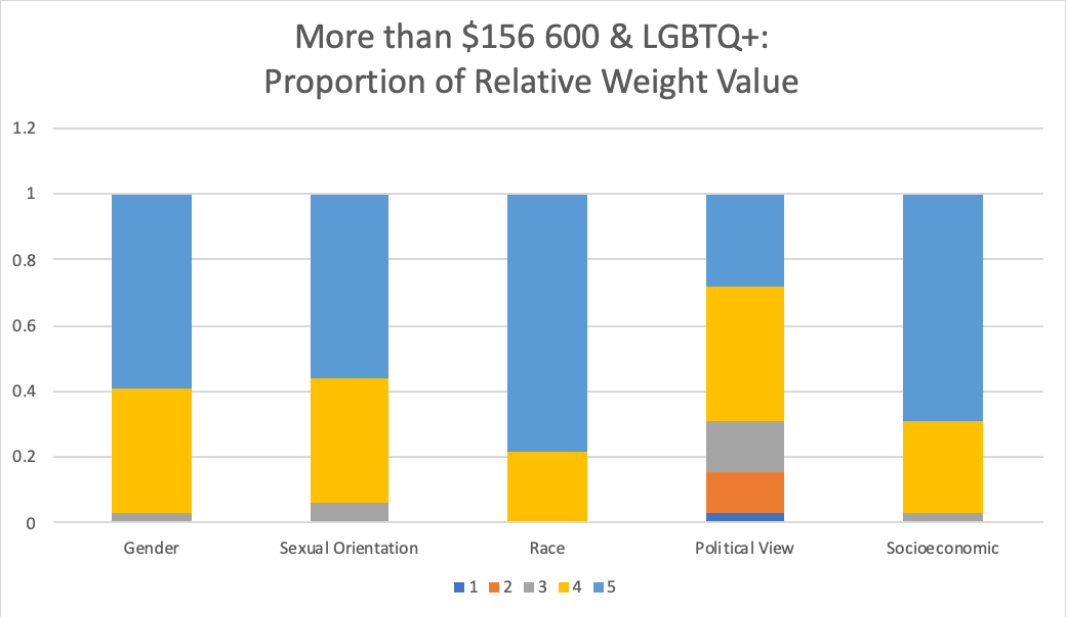
Graph 77: Non-LGBTQ+ & Upper (More than $156 600): Proportion of Relative Weight Values



Graph 78: LGBTQ+ & Lower (Less than $52 200): Proportion of Relative Weight Values



Graph 79: LGBTQ+ & Middle ($52 200 to $156 600): Proportion of Relative Weight Values

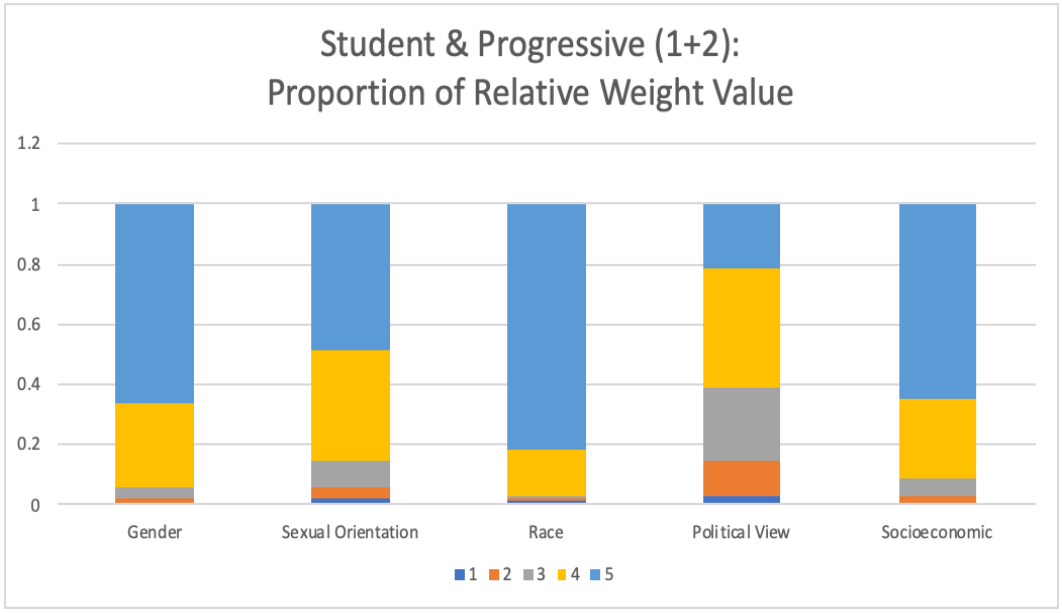


Graph 80: LGBTQ+ & Upper (More than $156 600): Proportion of Relative Weight Values

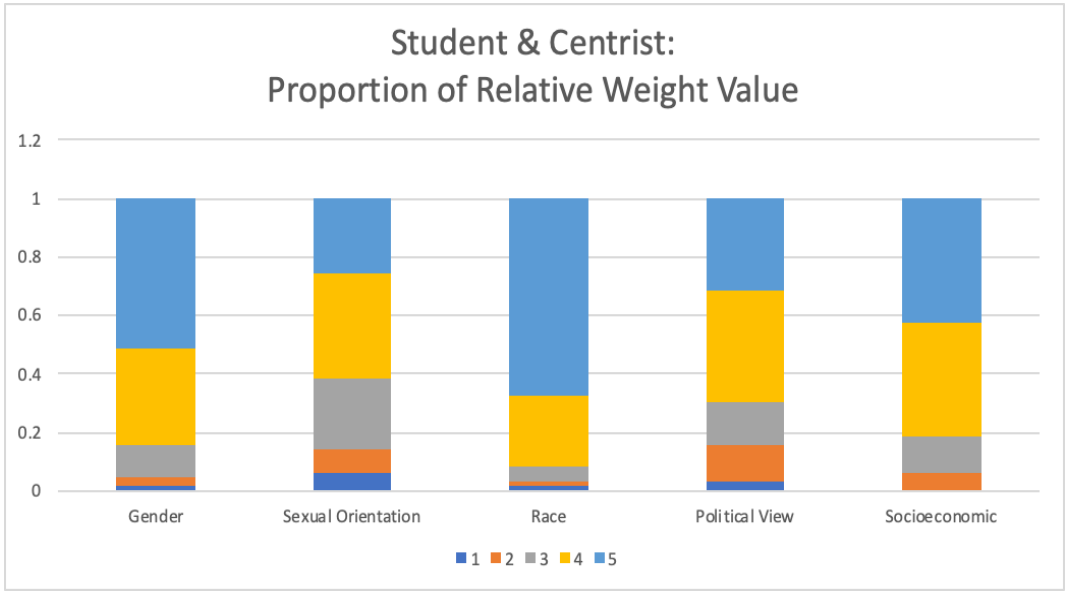
VII. Title & Political View

TITLE & POLITICAL VIEW	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Student Progressive	218	0.2105	0.1960	0.2183	0.1675	0.2078	0.5696	0.4740	0.5569
Student Centrist	70	0.2095	0.1788	0.2213	0.1865	0.2280	0.5746	0.4806	0.5625
Student Conservative	22	0.1951	0.1566	0.2198	0.2005	0.2280	0.5827	0.4893	0.5710

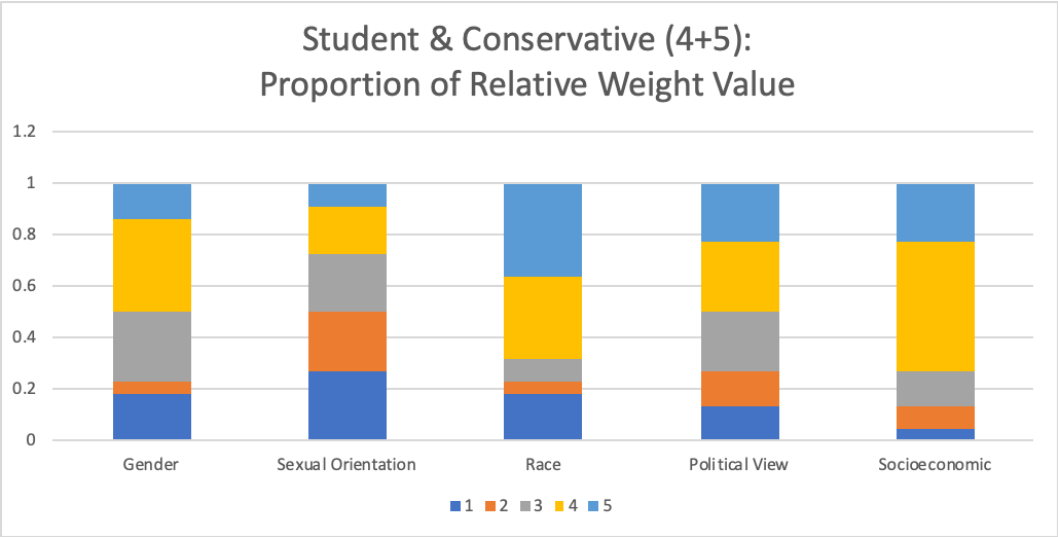
Table 25: Alpha Values and Diversity Indices for Title & Political View Combination



Graph 81: Student & Progressive (1 + 2): Proportion of Relative Weight Values



Graph 82: Student & Centrist: Proportion of Relative Weight Values

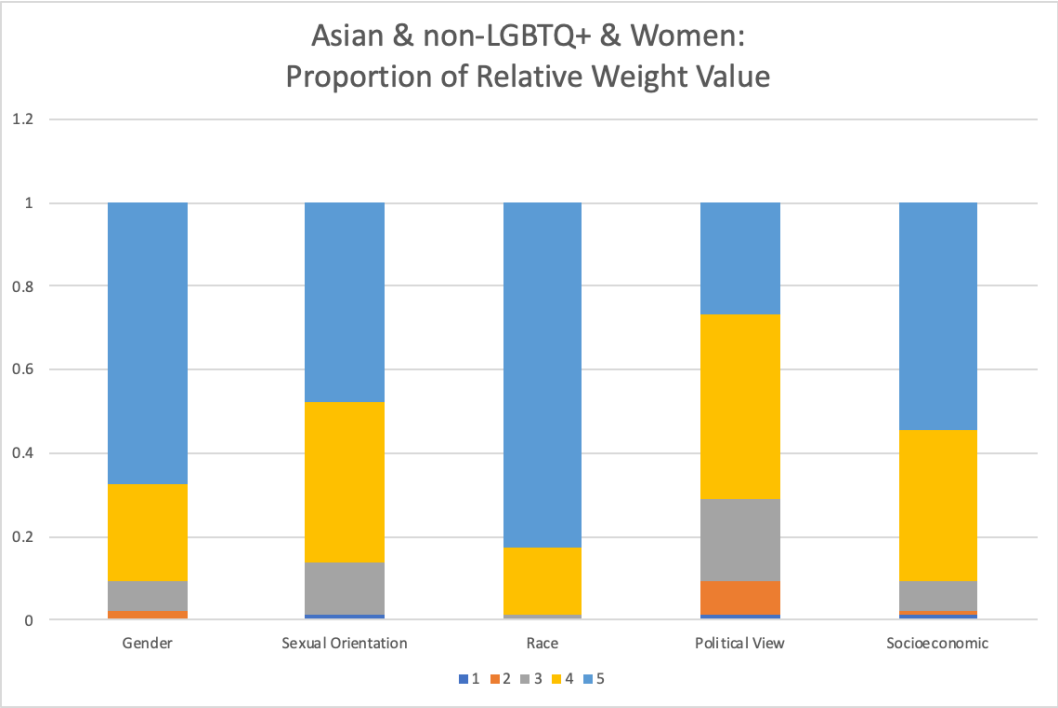


Graph 83: Student & Conservative (4 + 5): Proportion of Relative Weight Values

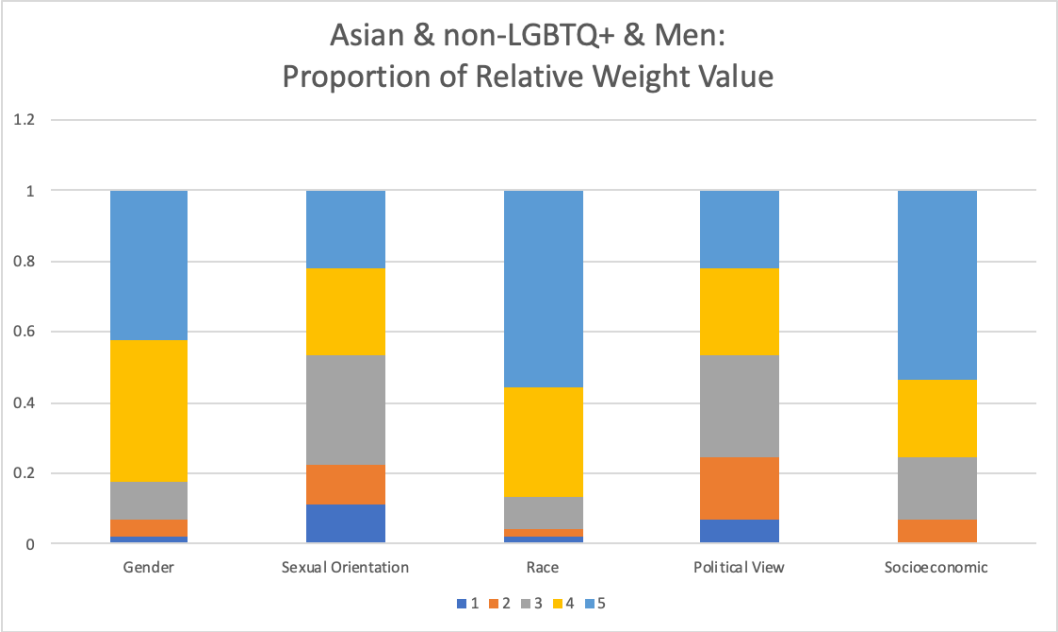
VIII. Race & Sexual Orientation & Gender

RACE & SEXUAL ORIENTATION & GENDER	n	α_g	α_s	α_r	α_p	α_{se}	$DI_{student}$	$DI_{faculty}$	DI_{all}
Asian Non-LGBTQ+ Women	86	0.2074	0.1963	0.2190	0.1762	0.2011	0.5704	0.4764	0.5581
Asian Non-LGBTQ+ Men	45	0.2135	0.1724	0.2237	0.1735	0.2169	0.5749	0.4779	0.5622
Black/African American LGBTQ+ Women	3	0.2000	0.2000	0.2308	0.1385	0.2308	0.5697	0.4689	0.5561
Black/African American LGBTQ+ Men	2	0.2143	0.1905	0.2143	0.1905	0.1905	0.5710	0.4790	0.5591
Black/African American Non-LGBTQ+ Men	6	0.2105	0.1805	0.2180	0.1805	0.2105	0.5736	0.4789	0.5613
White Non-LGBTQ+ Men	39	0.2041	0.1783	0.2196	0.1873	0.2106	0.5756	0.4818	0.5636
White LGBTQ+ Women	40	0.2086	0.2018	0.2166	0.1610	0.2120	0.5682	0.4721	0.5553

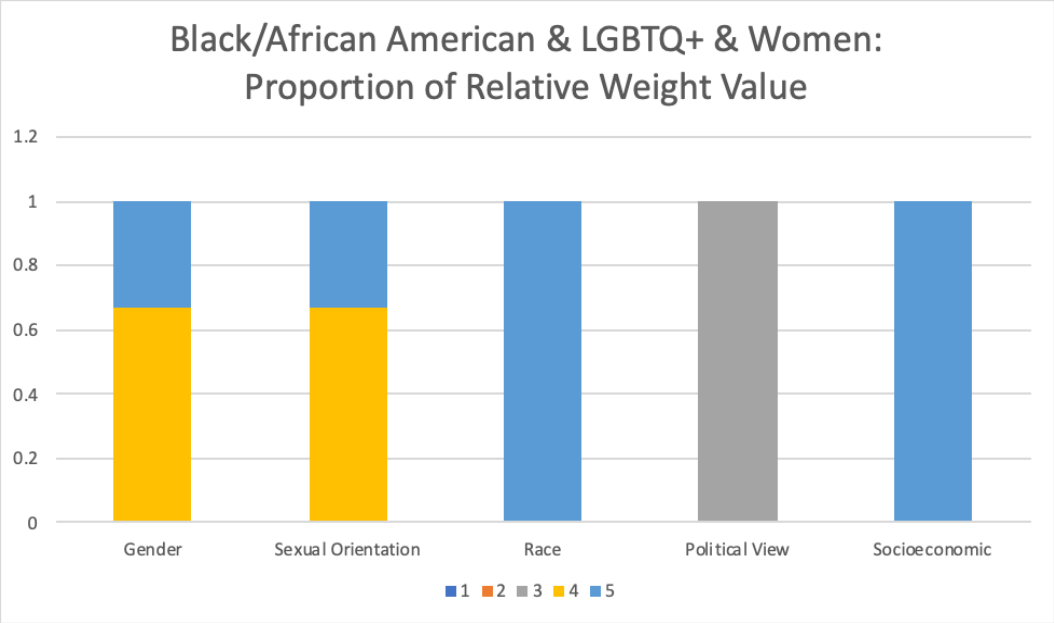
Table 26: Alpha Values and Diversity Indices for Race & Sexual Orientation & Gender Combination



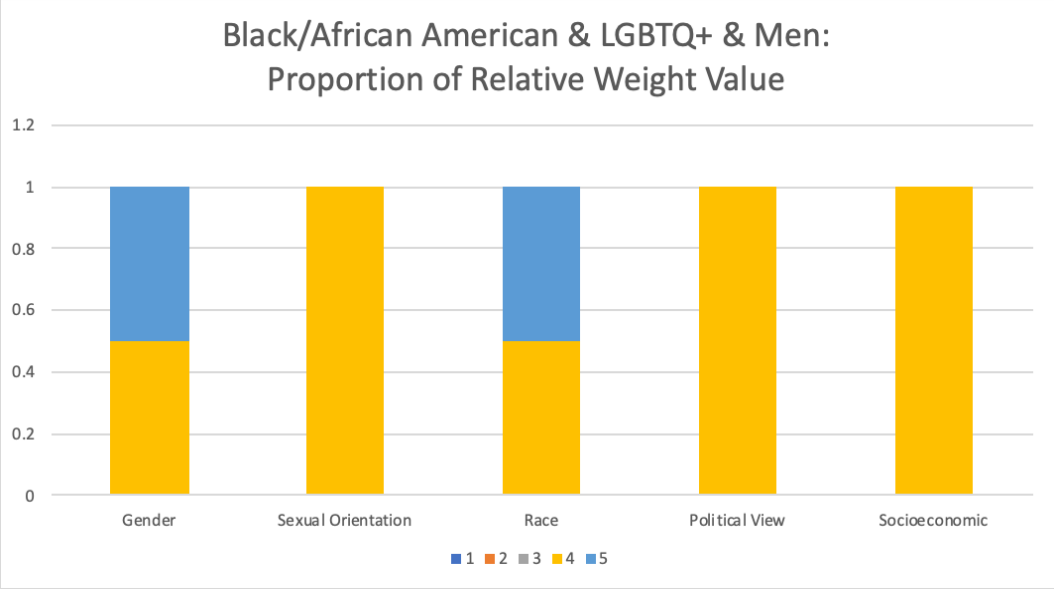
Graph 84: Asian & Non-LGBTQ+ & Women: Proportion of Relative Weight Values



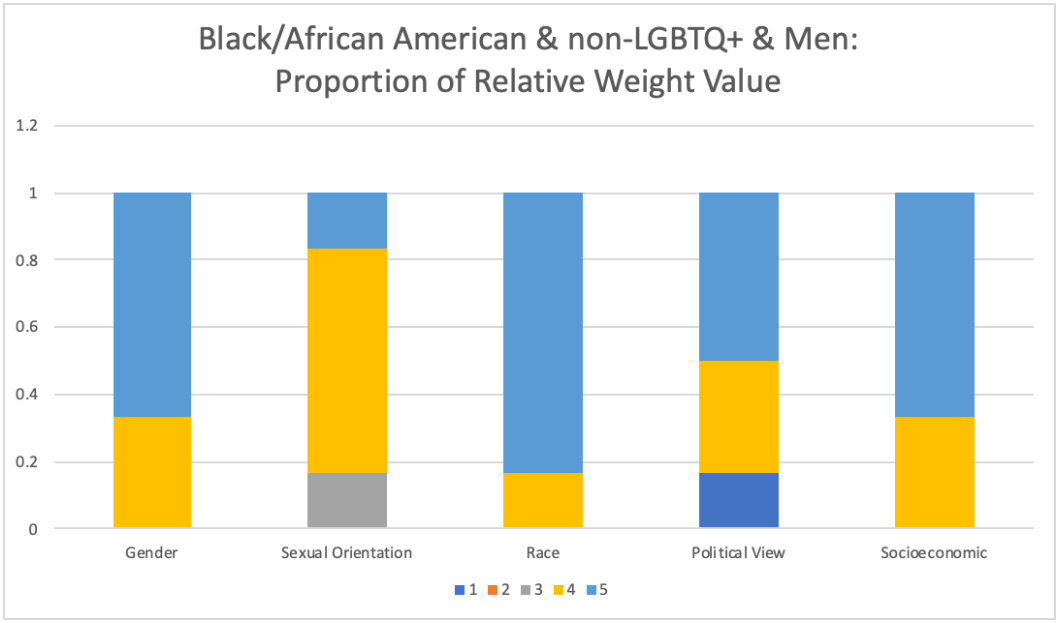
Graph 85: Asian & Non-LGBTQ+ & Men: Proportion of Relative Weight Values



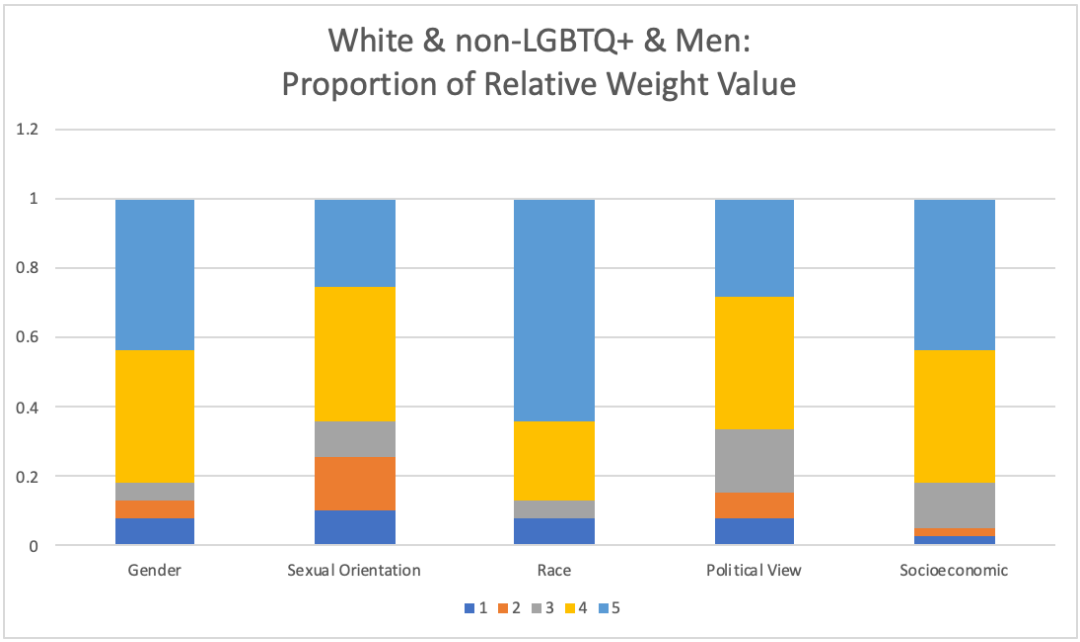
Graph 86: Black/African American & LGBTQ+ & Women: Proportion of Relative Weight Values



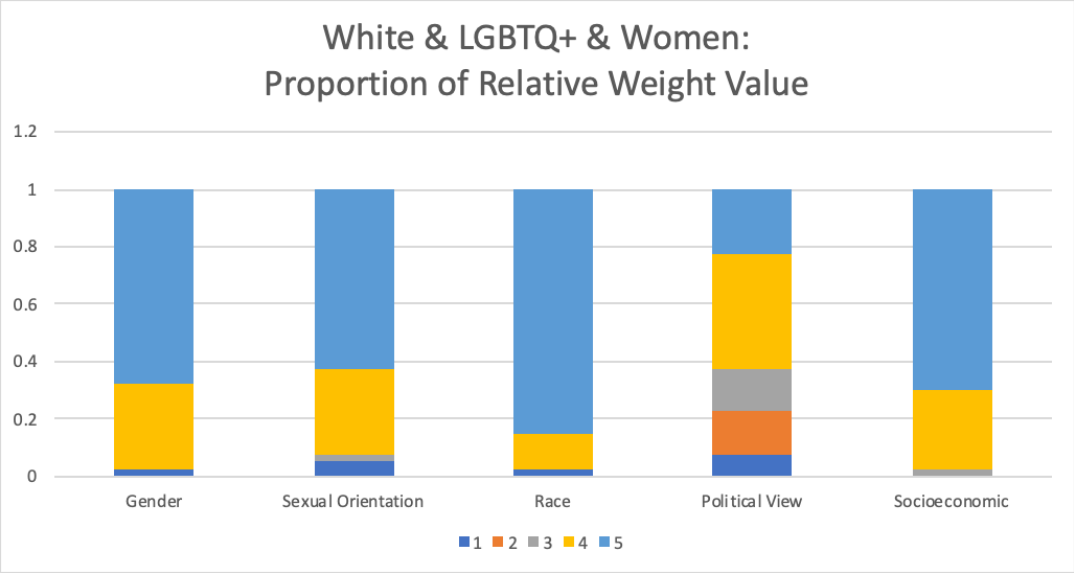
Graph 87: Black/African American & LGBTQ+ & Men: Proportion of Relative Weight Values



Graph 88: Black/African American & Non-LGBTQ+ & Men: Proportion of Relative Weight Values



Graph 89: White & Non-LGBTQ+ & Men: Proportion of Relative Weight Values



Graph 90: White & LGBTQ+ & Women: Proportion of Relative Weight Values