| Grade | Regular | Honors | College |
|---|---|---|---|
| A | 4.00 | 4.50 | 5.00 |
| B | 3.00 | 3.50 | 4.00 |
| C | 2.00 | 2.50 | 3.00 |
| D | 1.00 | 1.50 | 2.00 |
| F | 0.00 | 0.50 | 1.00 |

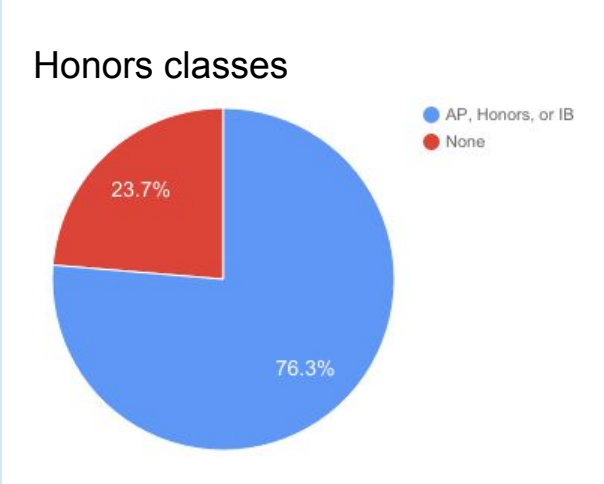
# Do students at Washburn Want Weighted GPAs?

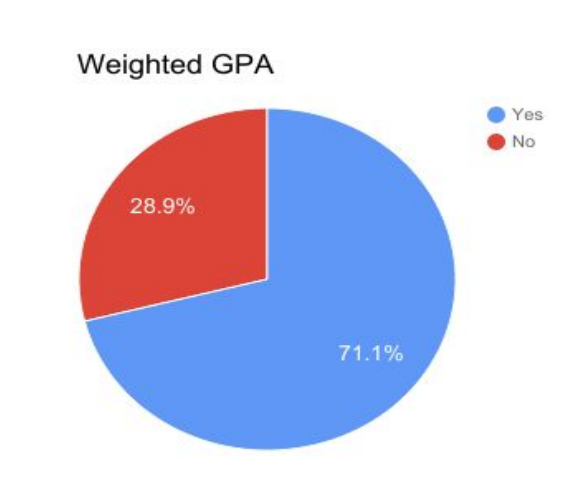
Talia H. Clare H. Ed S.

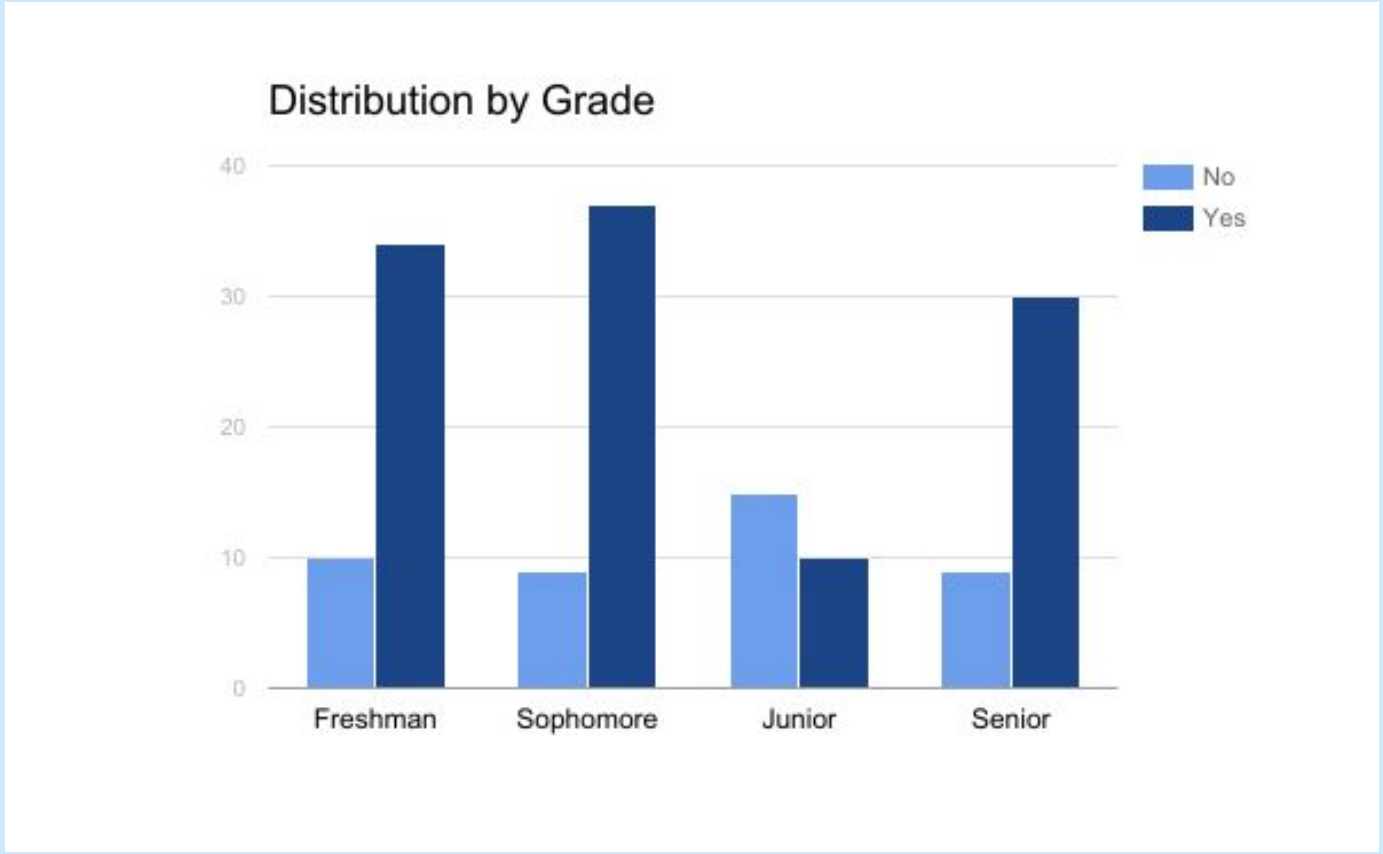
We took a random sample of 152 students and asked four questions:

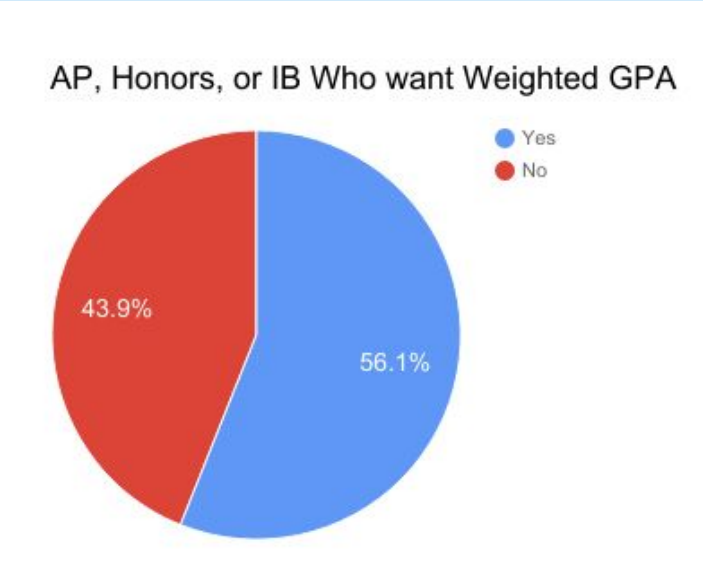
1. Are you taking or have you taken any AP, IB or Honors classes at Washburn?
2. Do you want Washburn to have weighted GPAs?
3. What is your current GPA?
4. What grade are you in?

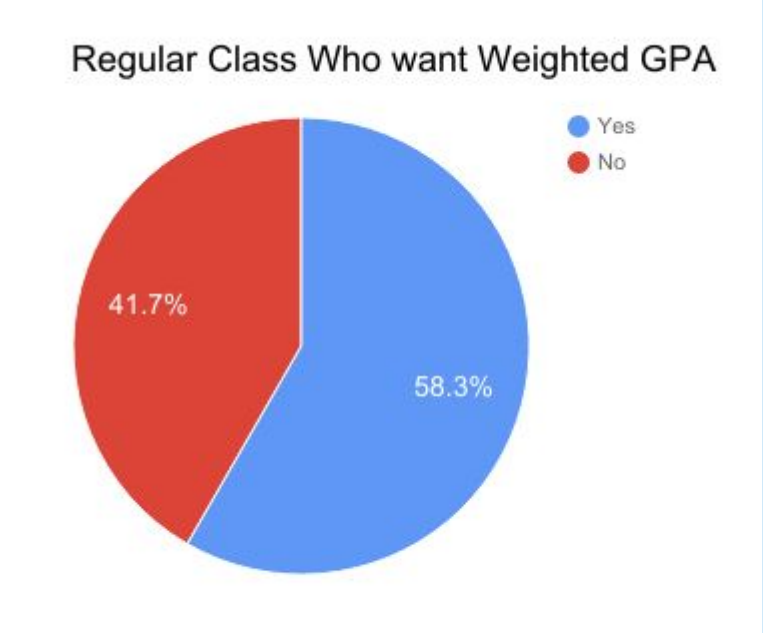
# Our Data


Honors classes
AP, Honors, or IB
None
23.7%
76.3%


Weighted GPA
Yes
No
28.9%
71.1%


Distribution by Grade
40
30
20
10
0
No
Yes
Freshman
Sophomore
Junior
Senior


AP, Honors, or IB Who want Weighted GPA
Yes
No
43.9%
56.1%


Regular Class Who want Weighted GPA
Yes
No
41.7%
58.3%

# How We Collected Our Data

- Assigned numbers to all 3rd period classes from 1-51
- Used calculator random number {1,51,9}
- Asked four questions
  - Are you taking or have you taken any AP, IB or Honors classes at Washburn?
  - Do you want Washburn to have weighted GPAs?
    - Weighted GPAs is when AP, IB and Honor classes are on a 0-5 scale, this can raise your GPA and thus affect your class rank positively or negatively
  - What is your current GPA?
  - What grade are you in?

# Chi-Squared Test of Association for Grade and Weighted GPAs

We are interested if there is an association between grade you are in and if you want a weighted GPA.

$H_o$- There is no association between the grade you are in and wanting a weighted GPA

$H_a$- There is an association between the grade you are in and wanting a weighted GPA

Assumption:

Random: We took a random sample by numbering the classes in 3rd period then using a random number generator✓

Independent: 1/10n≤N 1510≤N N≈1650

Expected Counts:

| Weighted GPA | 9 | 10 | 11 | 12 |
|---|---|---|---|---|
| No | 10 | 9 | 15 | 9 |
| Yes | 34 | 37 | 10 | 29 |

| Expected Counts | 9 | 10 | 11 | 12 |
|---|---|---|---|---|
| No | 12.366 | 12.928 | 7.0261 | 10.68 |
| Yes | 31.634 | 33.072 | 17.974 | 27.32 |

Test Statistic: $X^2=\sum(\text{observed-expected})^2/\text{expected}$

$(10-12.366)^2/12.366+(34-31.634)^2/31.634+...(29-27.32)^2/27.32$

$X^2=15.24410147$ DF=3

Obtain a P-Value

P-Value=.001488

Since the P-Value is significant at the .05 alpha level, we reject the null hypothesis.

Make a decision

There is significant evidence that there is an association between what grade you are in, and if you want weighted GPA's

# One-Proportion Z-interval for proportion of students that want weighted GPAs

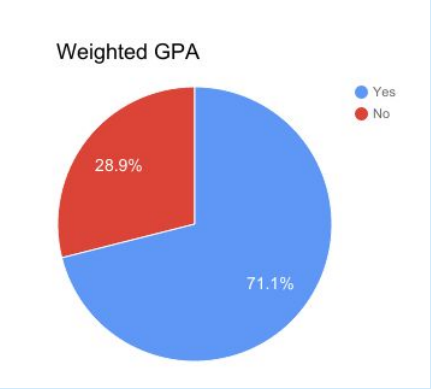
We are interested in the true proportion of Washburn students that want weighted GPAs

Assumptions:

Random: We took a random sample by numbering the classes in 3rd period then using a random number generator✓

Normal: $\hat{p}(n)=10$ $(\hat{p}-1)n=10$ $.29801(151)=45$ $.70199(151)=106$ ✓

Independent: $1/10n \leq N$ $1510 \leq N$ $N \approx 1650$ ✓



Interval-

Statistic±Critical value($\sqrt{\hat{p}(1-\hat{p})/n}$)

.70199±1.96(√.70199(..29801)/151)= .629036, .774944

Conclusion

We are 95% confident that the interval .629036 to .774944 will capture the true proportion of students who want weighted GPAs.

# Chi-Square test for association between if students have taken advanced classes and if they want weighted GPAs

We are interested in if there is an association between if students have taken advanced classes and if they want weighted GPAs

$H_o$ = There is no association between if students have taken advanced classes and if they want weighted GPAs
$H_a$ = There is an association between if students have taken advanced classes and if they want weighted GPAs
Assumption:

Random: We took a random sample by numbering the classes in 3rd period then using a random number generator✓

Independent: 1/10n≤N 1510≤N N≈1650✓

Expected Counts: All greater than 5✓

| Actual Counts | Yes(Want weighted GPA) | No |
|---|---|---|
| Yes (honors, AP, IB) | 37 | 29 |
| No | 21 | 15 |

| Expected Counts | Yes(want weighted GPAs) | No |
|---|---|---|
| Yes(Honors, AP, IB classes) | 37.529 | 28.471 |
| No(Honors, AP, or IB classes) | 20.471 | 15.529 |

## Test Statistic–$X^2=\sum(\text{observed-expected})^2/\text{expected}$

$(37-37.529)^2/37.529+(29-28.471)^2/28.471+...(15-15.529)^2/15.529$

$X^2=.0490524366$ DF=1

Obtain a P-Value

P-Value=.8247203841

Since the P-Value is not significant and the .05 alpha level we fail to reject the null hypothesis.

Make a Decision

There is strong evidence that there is no association between taking an honors, AP or IB class and wanting weighted GPAs

# Summary

- Conclusion
  - Majority of sample taken wanted weighted GPAs
  - Very strong evidence that grade affects wanting weighted GPAs
  - No association between classes taken and wanting weighted GPAs
  - Despite the limited ability of the sample it it is clear most wanted weighted GPAs despite the grade and classes of students
- Errors
  - People refused to respond to some questions (Non response bias)
  - People faked GPAs, unreal numbers, this was assumed (Response bias)
  - Not all people were in class
- Future Studies
  - Survey of multiple schools and hopefully a census of each school if not more in each survey


fig 1.0 The Extended Bell Curve.