

Student Experience of Instruction: Interpreting Statistics in Instructor Reports

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Outline

- What we expect to achieve in this session
- Changes to instructor reports
- About SEI data
- Stats in the instructor report (Interpolated median, Percent Favourable and Dispersion Index)
- Group Activity
- Q & A



What we expect to achieve

- At the end of this session, You will:
 - have a better understanding of the statistics in instructors reports.
 - explain how two of these measures (IM & % Fav) work in tandem and how the third metric (Dispersion) could be used to explain differences in ratings.
 - Use simple graphics (scatter plot) to explain these concepts.

Changes to Instructor Reports

- Transition to the new metrics in instructor reports started in 2018 and was completed in 2019/2020.
- Key reported statistics include:
 - Response Rate
 - Interpolated Median
 - Percent Favourable
 - Dispersion Index
- In 2021, changes were made to the 6 University Module Items (UMI) and the modified/new questions were implemented in 2021 Winter term 1.



About SEI data

- SEI data is categorical, but ordinal in nature.
- **Ordinal** means that it has a sense of order e.g. Strongly Agree is higher (better) than Agree, higher than neutral...etc.
- UBC collects SEI data using a balanced (odd-numbered) Likert scale
- UMI questions use a 5-point Likert scale
(Strongly Disagree, Disagree, **Neutral**, Agree, Strongly Agree)
- Some Faculty questions use a 7-point Likert scale
(Entirely Disagree, Mostly Disagree, Somewhat Disagree, **Neither Agree nor Disagree**, Somewhat Agree, Mostly Agree, Entirely Agree)



1



Strongly
Disagree

2



Disagree

3



Neutral

4



Agree

5



Strongly
Agree



1

2

3

4

5

6

7

Entirely
Disagree

Mostly
Disagree

Somewhat
Disagree

Neither
Agree nor
Disagree

Somewhat
Agree

Mostly
Agree

Entirely
Agree



Instructor Report



Response Rate



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2022S UBC Individual Instructor Reports (TEST) for BIOL 111 101 (TEST) - Introduction to Modern Biology (Bluetest Two)

Project Title: **2022S UBC Instructor SEI Surveys (TEST)**

Course Audience: **2**
Responses Received: **2**
Response Ratio: **100%**

Report Comments

Recommended Minimum Response Rates

Class Size	Recommended Minimum Response Rates based on 80% confidence & $\pm 10\%$ margin
< 10	75%
11 - 19	65%
20 - 34	55%
35 - 49	40%
50 - 74	35%
75 - 99	25%
100 - 149	20%
150 - 299	15%
300 - 499	10%
> 500	5%



a place of mind

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UMI Questions & Reported Stats

University Module Questions

University Module Questions

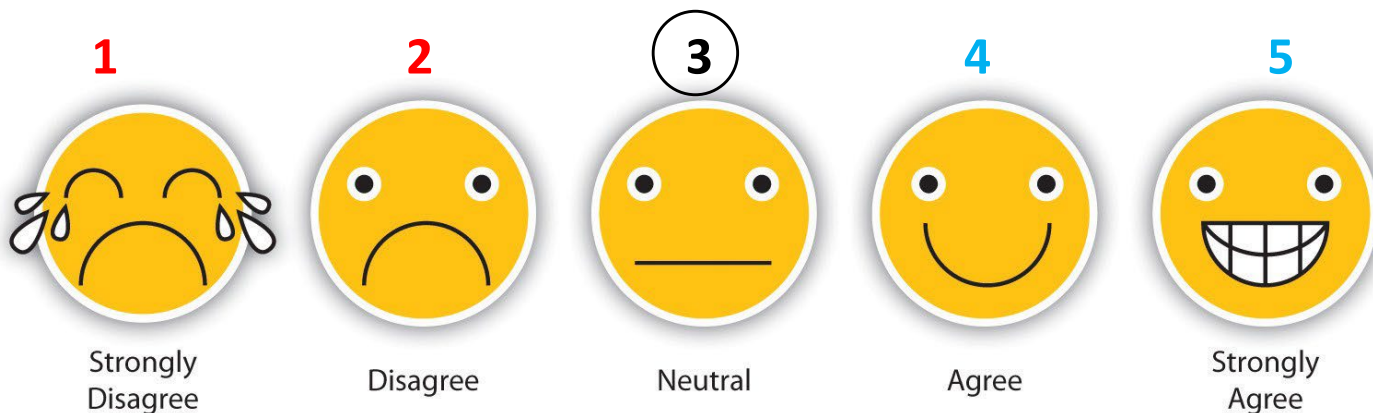
Question	N	n	SD	D	N	A	SA	NA	M	DI
Throughout the term, the instructor explained course requirements so it was clear to me what I was expected to learn.	2	2	0	0	0	0	2	0	5.0	0.0
The instructor conducted this course in such a way that I was motivated to learn.	2	2	0	0	1	0	1	0	4.0	0.5
The instructor presented the course material in a way that I could understand.	2	2	0	0	0	1	1	0	4.5	0.3
Considering the type of class (e.g., large lecture, seminar, studio), the instructor provided useful feedback that helped me understand how my learning progressed during this course.	2	2	0	0	1	1	0	0	3.5	0.3
The instructor showed genuine interest in supporting my learning throughout this course.	2	2	0	0	0	0	2	0	5.0	0.0
Overall, I learned a great deal from this instructor.	2	2	0	0	1	0	1	0	4.0	0.5

Question	%Favourable
Throughout the term, the instructor explained course requirements so it was clear to me what I was expected to learn.	100%
The instructor conducted this course in such a way that I was motivated to learn.	50%
The instructor presented the course material in a way that I could understand.	100%
Considering the type of class (e.g., large lecture, seminar, studio), the instructor provided useful feedback that helped me understand how my learning progressed during this course.	50%
The instructor showed genuine interest in supporting my learning throughout this course.	100%
Overall, I learned a great deal from this instructor.	50%



Percent Favourable

- Favourable responses are those higher than “Neutral” e.g. “Agree” and “Strongly Agree” on a 5-point Likert-type scale
- **Percent favourable** is the proportion of responses higher than neutral, expressed as a percentage of total received responses.
- It is simple, intuitive, informative and easy to calculate.



Dispersion Index

- A measure of data spread that ranges from 0 to 1.
- A value of zero indicates that all respondent students rated their experience of instruction the same.
- A value of 1 is obtained when respondents split evenly between the two extreme values (Strongly Disagree & Strongly Agree on a 5-point scale).
- In UBC SEI data, Dispersion Index rarely exceeds 0.8, and such high dispersion is often associated with surveys that did not meet the minimum recommended response rate.



Dispersion Index: Examples

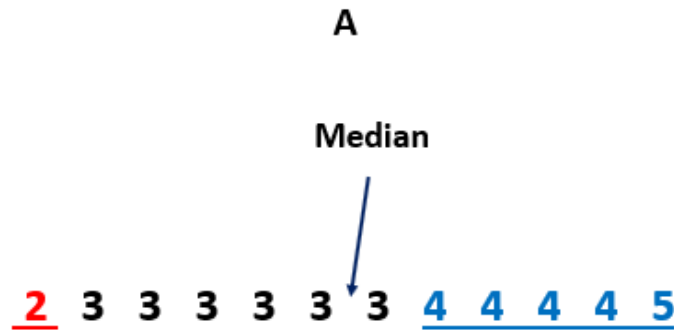
<u>Low Dispersion</u>					
Response	Count	proportion (P)	cum Proportion (F)	1.0 - F	F*(1.0 - F)
Strongly Disagree	0	0	0	1	0
Disagree	0	0	0	1	0
Neutral	0	0	0	1	0
Agree	40	0.666666667	0.666666667	0.333333333	0.22222222
Strongly Agree	20	0.333333333	1	0	0
Total Responses	60			Dispersion Index	0.22

<u>High Dispersion</u>					
Response	Count	proportion (P)	cum Proportion (F)	1.0 - F	F*(1.0 - F)
Strongly Disagree	22	0.22	0.22	0.78	0.1716
Disagree	27	0.27	0.49	0.51	0.2499
Neutral	16	0.16	0.65	0.35	0.2275
Agree	18	0.18	0.83	0.17	0.1411
Strongly Agree	17	0.17	1	0	0
Total Responses	100			Dispersion Index	0.79

<u>Maximum Dispersion</u>					
Response	Count	proportion (P)	cum Proportion (F)	1.0 - F	F*(1.0 - F)
Strongly Disagree	30	0.5	0.5	0.5	0.25
Disagree	0	0	0.5	0.5	0.25
Neutral	0	0	0.5	0.5	0.25
Agree	0	0	0.5	0.5	0.25
Strongly Agree	30	0.5	1	0	0
Responses	60			Dispersion Index	1.0



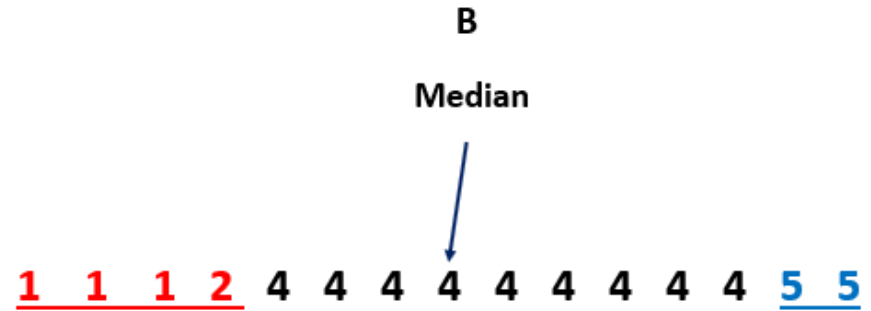
Medians and Distribution



Median = 3

Of the 12 responses:

One response is less than the median
Five responses are greater than the median
Six responses are equal to the median



Median = 4

Of the 15 responses:

Four responses are less than the median
Two responses are greater than the median
Nine responses are equal to the median

Interpolated Median

The interpolated median is an “Adjusted median” which considers:

Number of responses < Median

Number of responses > Median

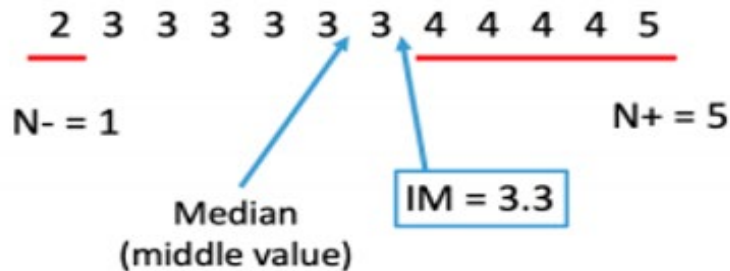
Number of responses = Median.

$$IM = M + (n_+ - n_-)/2n$$

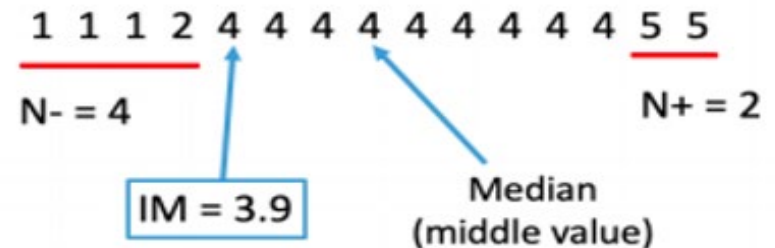
Where:

- IM = the Interpolated Median
- M = the Median
- n = number of data points equal to the median
- n₊ = number of data points greater than the median
- n₋ = number of data points less than the median

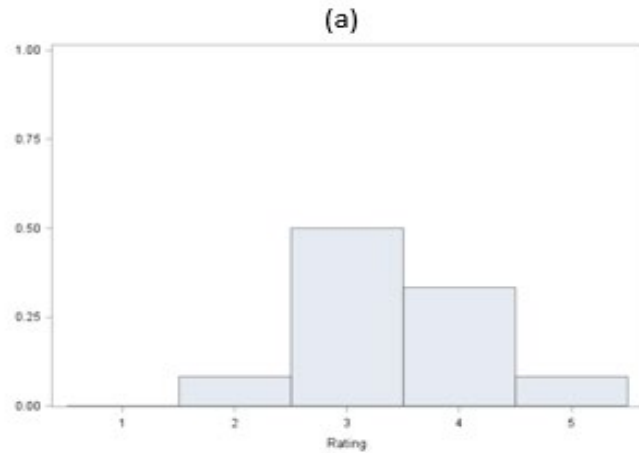
A



B



Interpolated Median



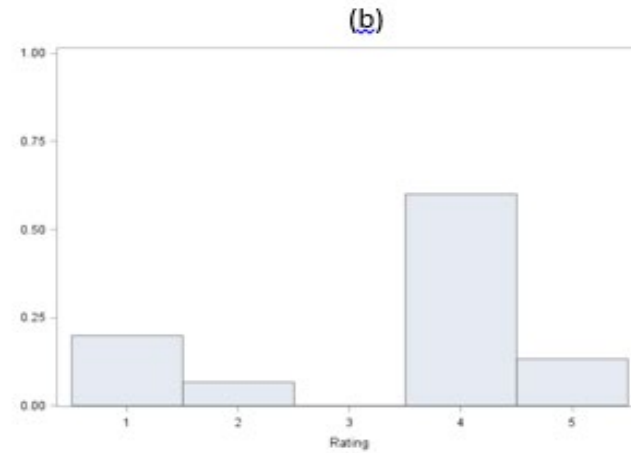
Score	Frequency
1	0
2	1
3	6
4	4
5	1

Mean 3.4

%Fav 42%

Median 3.0

I Median 3.3



Score	Frequency
1	3
2	1
3	0
4	9
5	2

Mean 3.4

%Fav 73%

Median 4.0

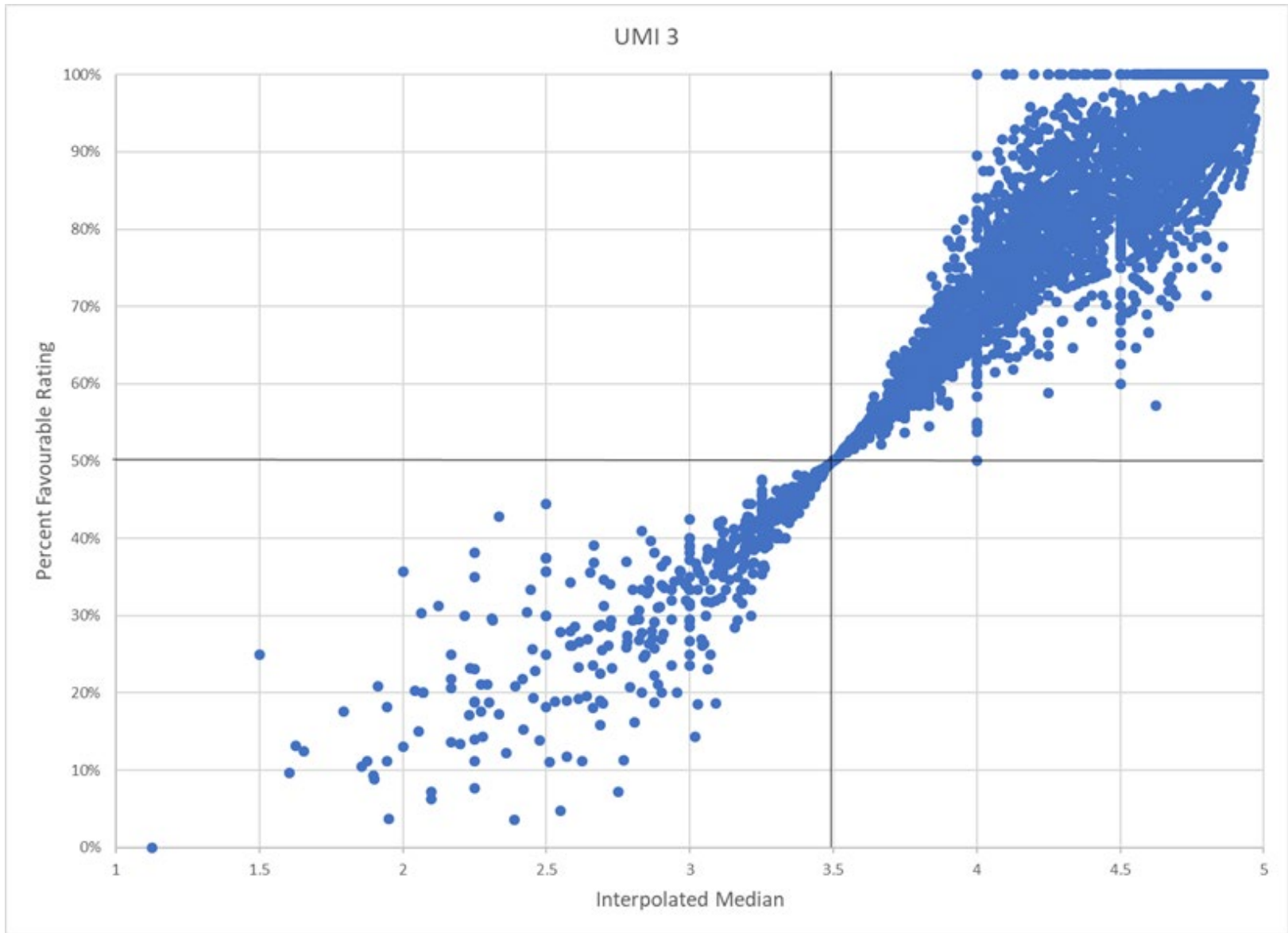
I Median 3.9

Interpolated Median

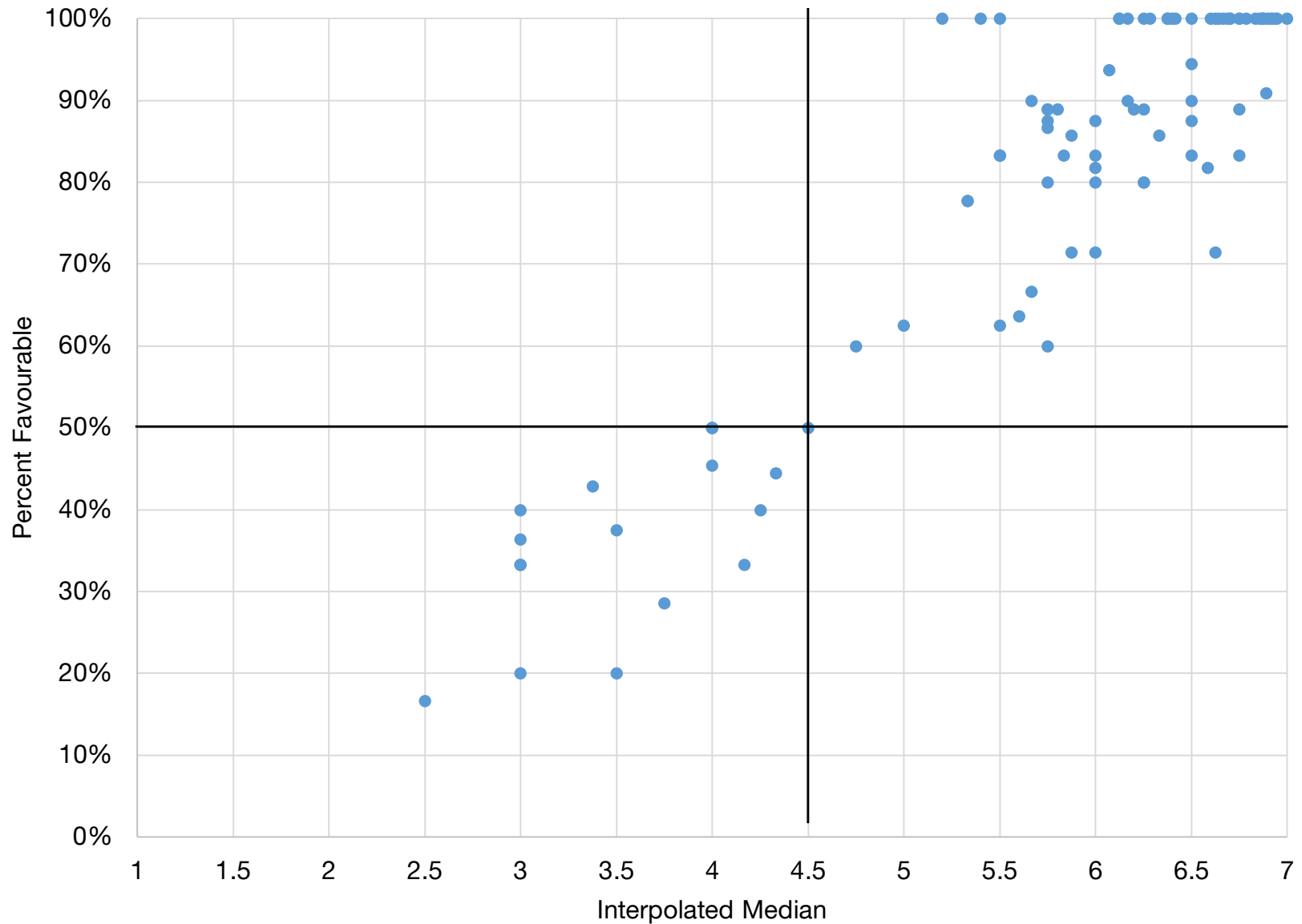
Given that students tend to rate their instructors favourably more often than not, the Interpolated Median is preferred to the mean because:

- Interpolated Median better reflects the distribution of students' responses than does the Mean or the Median.
- In particular, the Interpolated Median is more closely associated with percent favourable ratings.





The Relationship for a 7-point Scale



Academic Unit (Red Dot)

IM=4.2 % Fav.=76%
DI=0.52

Case A

IM=3.9 % Fav.=80%
DI=0.35

Case B

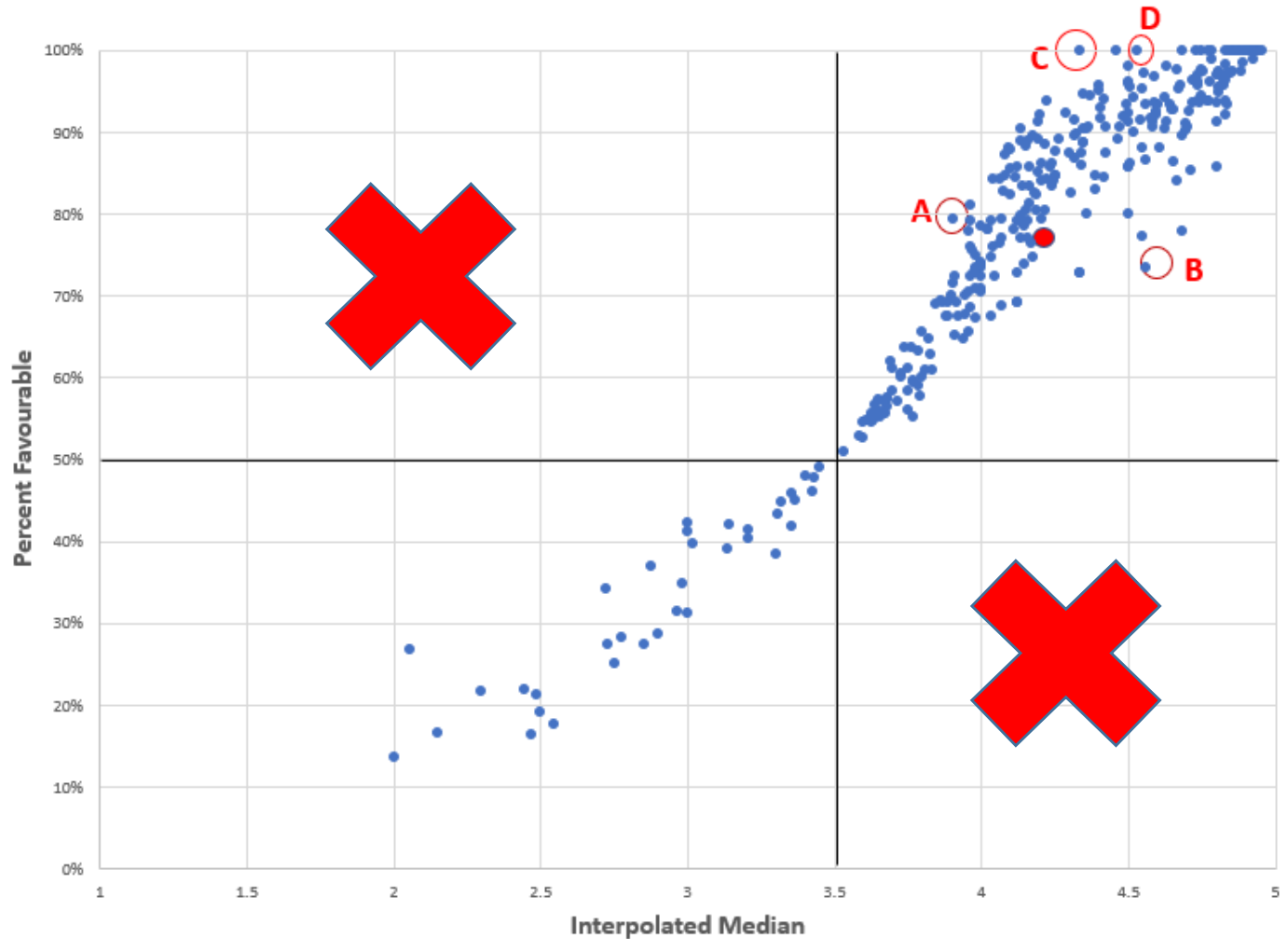
IM=4.6 % Fav.=73%
DI=0.57

Case C

IM=4.3 % Fav. =100%
DI=0.24

Case D

IM=4.5 % Fav.=100%
DI=0.25



Activity

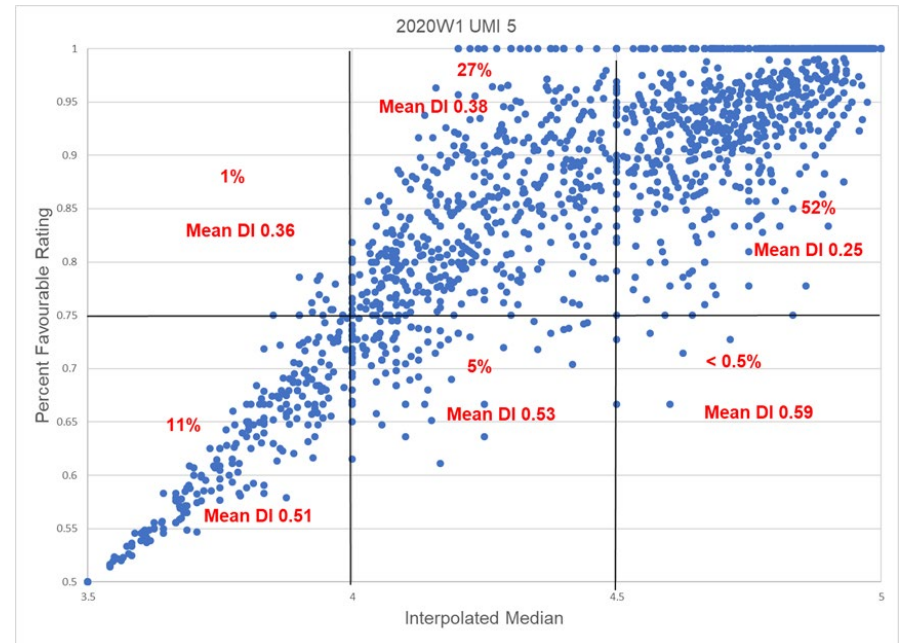
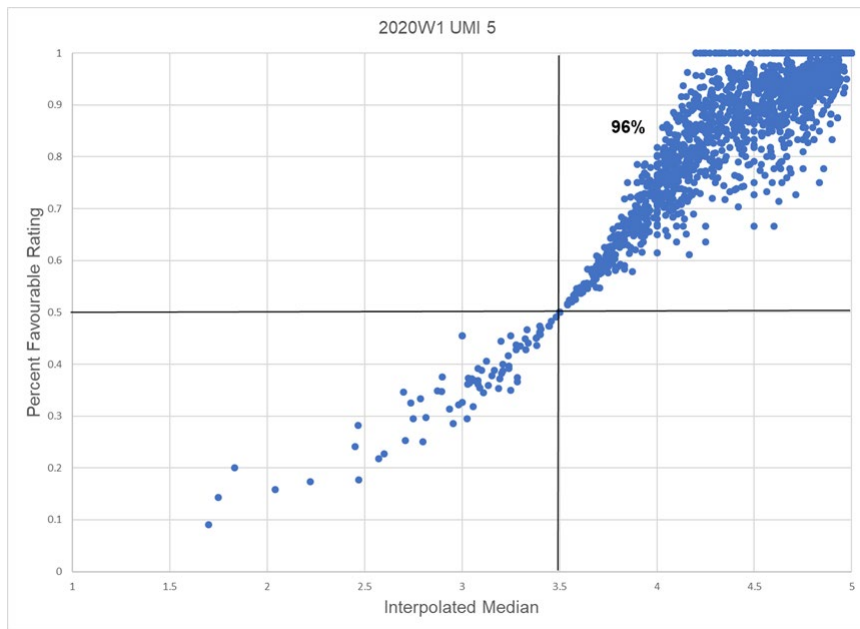
Room 1

UMI_5: The instructor showed genuine interest in supporting my learning throughout this course.

The figure on the left is a graphical depiction of about 2,000 SEI reports from 2020W1, plotting IM against PF. The figure on the right is a closer look at the ratings in the upper right quadrant. The % of evaluations in each sub-quadrant is given along with the mean DI (in red).

Q1: What is the percentage of evaluations in which 50% or more student respondents did not rate their experience favourably?

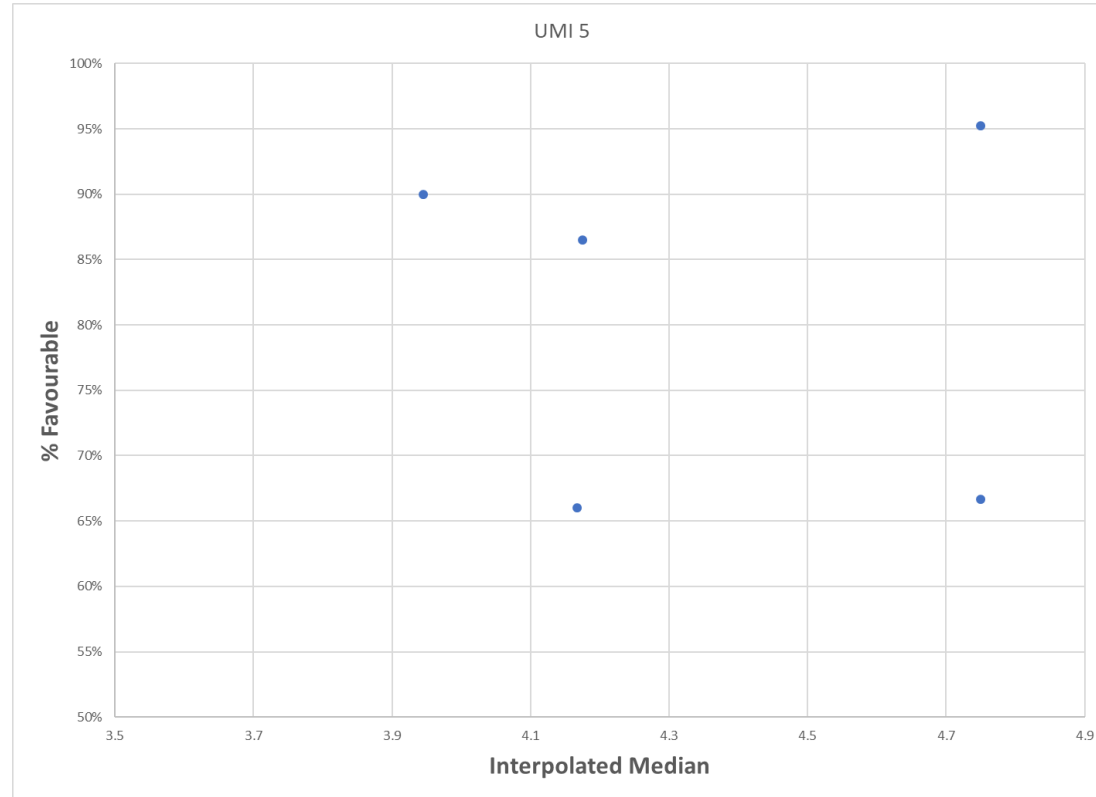
Q2: Fill in the blank: In about four-fifths of all evaluations in 2020W1, ___% or more student respondents 'agree' or 'strongly agree' that the instructor showed concern for student learning



Room 2

UMI_5: The instructor showed genuine interest in supporting my learning throughout this course.

IM	%Fav	DI
4.8	95%	0.27
4.8	67%	0.44
4.2	86%	0.37
4.2	66%	0.51
3.9	90%	0.09



Q1: How would you describe the SEI ratings for the five instructors considering:

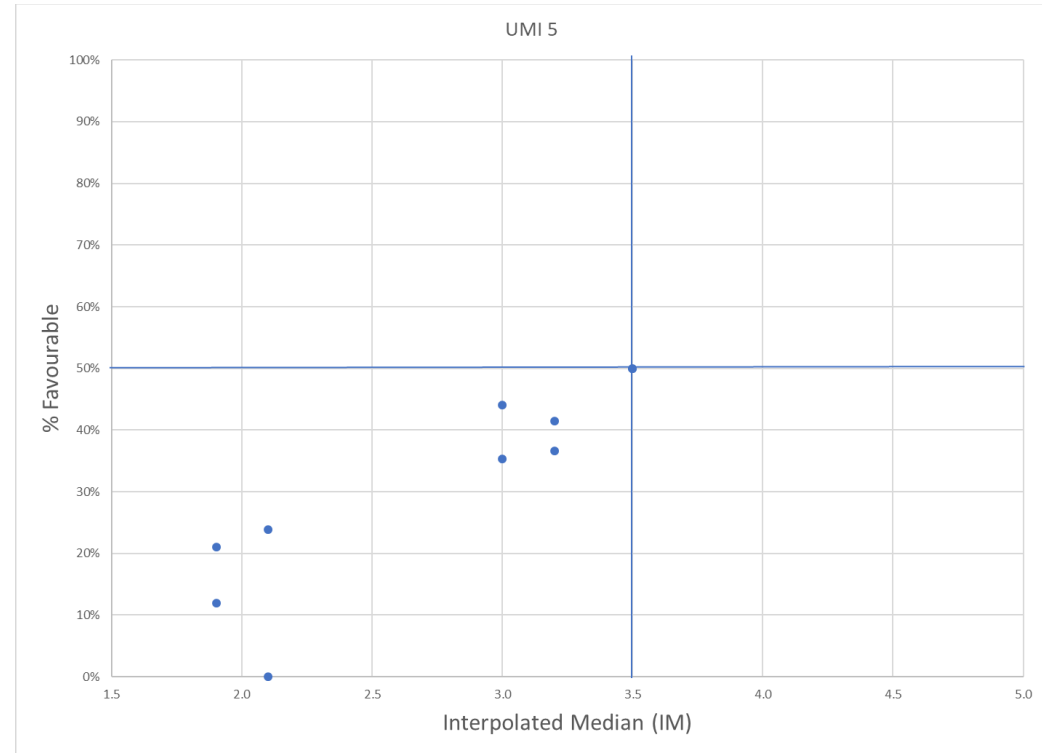
- The interpolated Median (IM) only
- % Favorable only
- Both IM and % Favourable

Q2: What effect does Dispersion Index (DI) seem to have?

Room 3

UMI_5: Instructor showed genuine interest in supporting my learning throughout this course.

<u>IM</u>	<u>PF</u>	<u>DI</u>
1.9	12%	0.59
1.9	21%	0.66
2.1	0%	0.43
2.1	24%	0.51
3.0	44%	0.65
3.0	35%	0.56
3.2	37%	0.50
3.2	41%	0.62
3.5	50%	0.45
3.5	50%	0.71



Consider these stats from 10 SEI reports in 2021W (plotted on the right):

Q1) For $IM < 3.5$, what effect does Dispersion Index (DI) seem to have for a given IM?

Q2) Does the answer to Q1 applies to an IM of 3.5? Why or why not?

Questions?

Thank You

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