

Student Experience of Instruction: Interpreting Statistics in Instructor Reports

Abdel Azim Zumrawi, PhD, P.Stat., RPF(Ret.)
Planning & Institutional Research

CTLT Spring Institute

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Outline

- What we expect to achieve in this session
- Changes to instructor reports
- About SEI data
- 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 to others who work with SEI data.

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



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

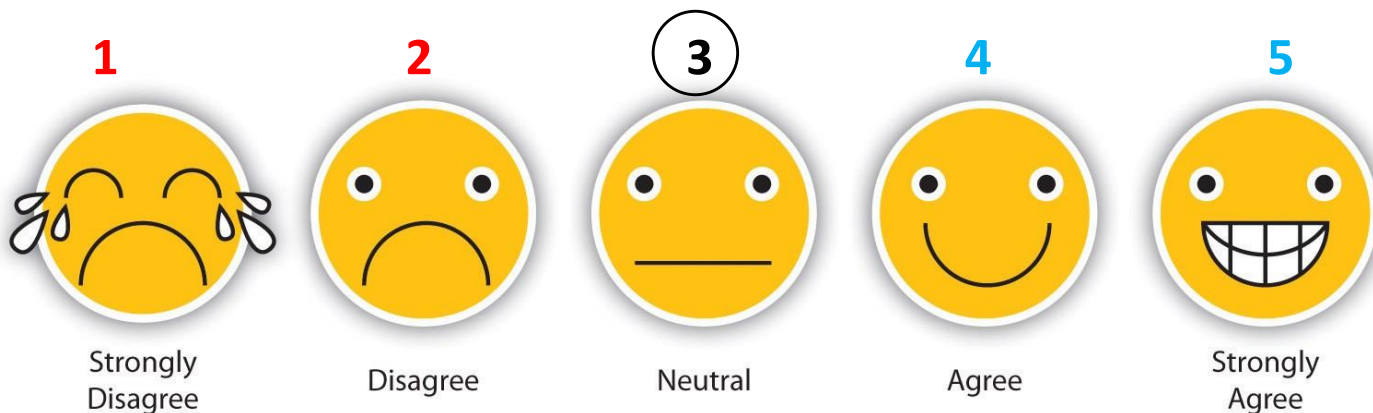
Question	N	n	SD	D	N	A	SA	N/A	M	DI
Throughout the term, the instructor explained course requirements so it was clear to me what I was expected to learn.	2	2	0	0	0	0	2	0	5.0	0.0
The instructor conducted this course in such a way that I was motivated to learn.	2	2	0	0	1	0	1	0	4.0	0.5
The instructor presented 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

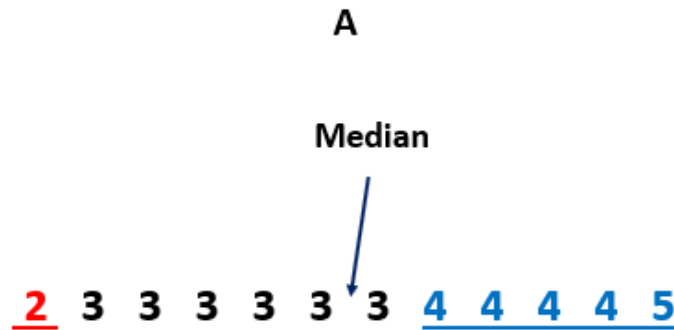
<u>Low Dispersion</u>					
Response	Count	proportion (P)	cum Proportion (F)	1.0 - F	F*(1.0 - F)
Strongly Disagree	0	0	0	1	0
Disagree	0	0	0	1	0
Neutral	0	0	0	1	0
Agree	40	0.666666667	0.666666667	0.333333333	0.222222222
Strongly Agree	20	0.333333333	1	0	0
Total Responses	60			Dispersion Index	0.22

<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



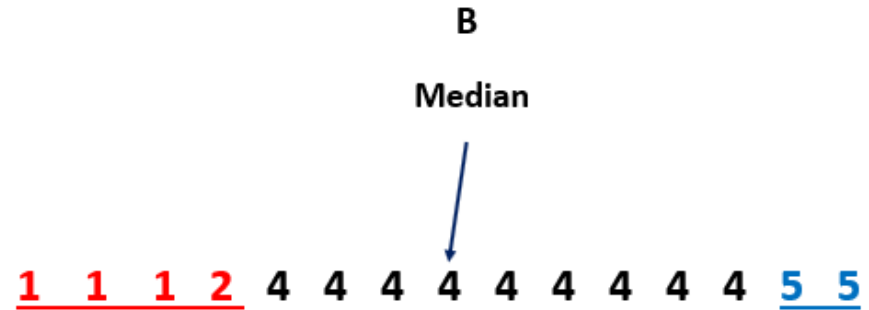
Medians and Distribution



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

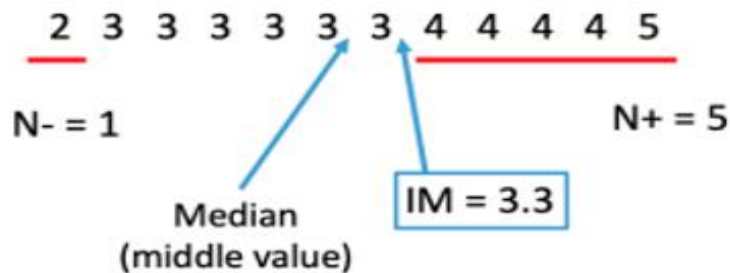
Number of responses = Median.

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

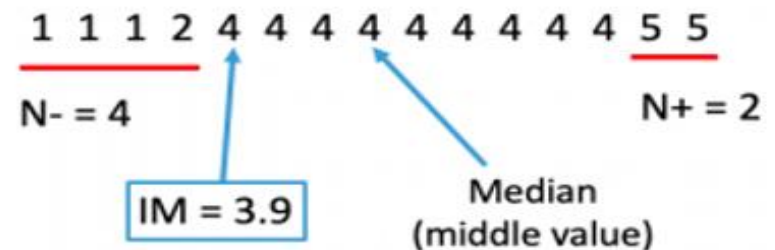
Where:

- 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

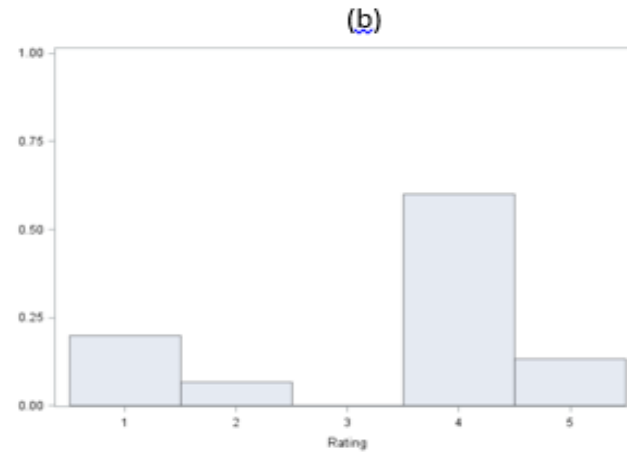
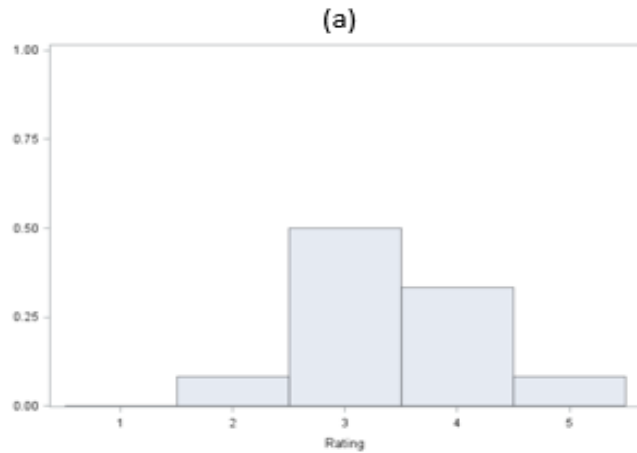
A



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

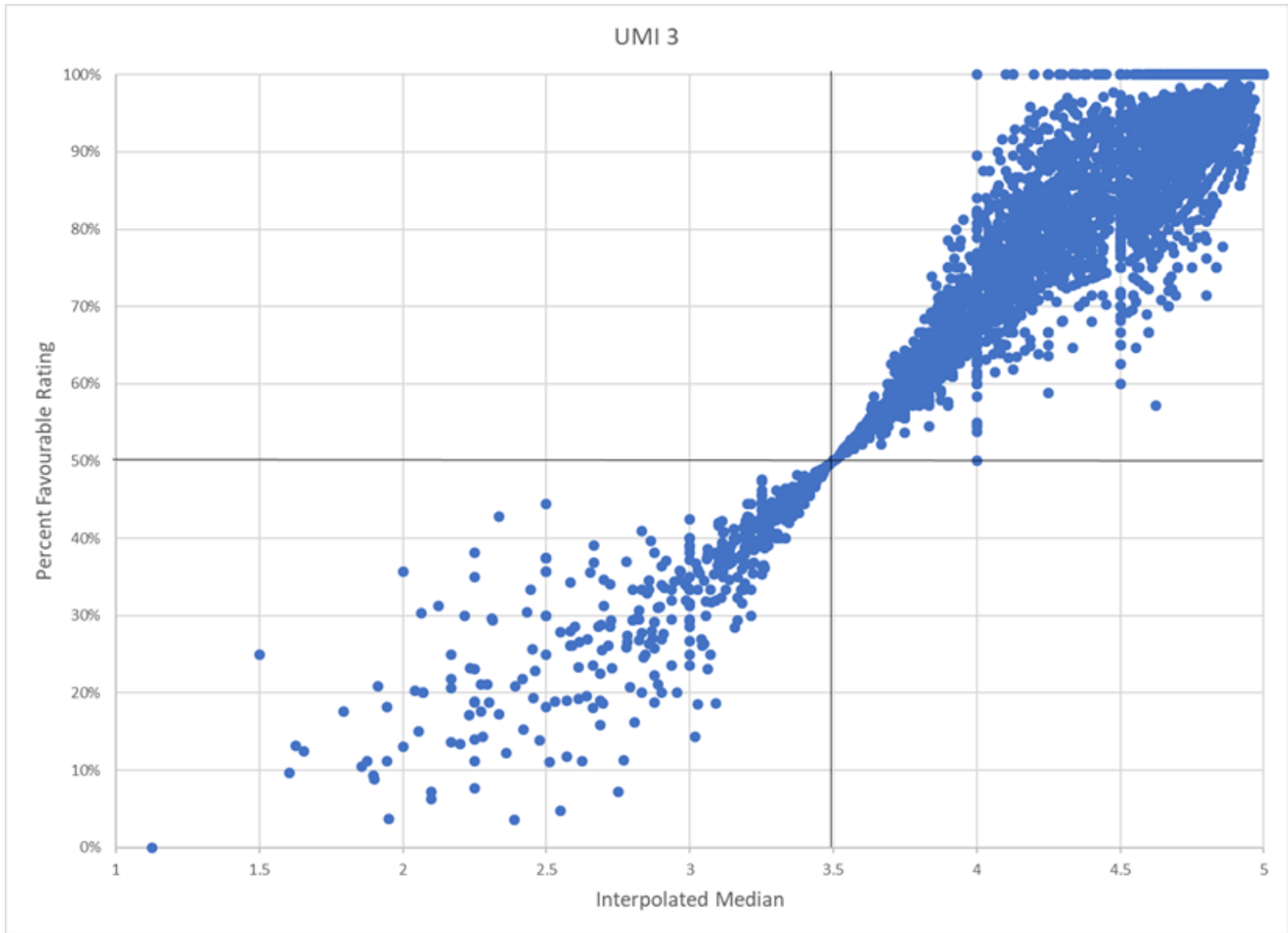


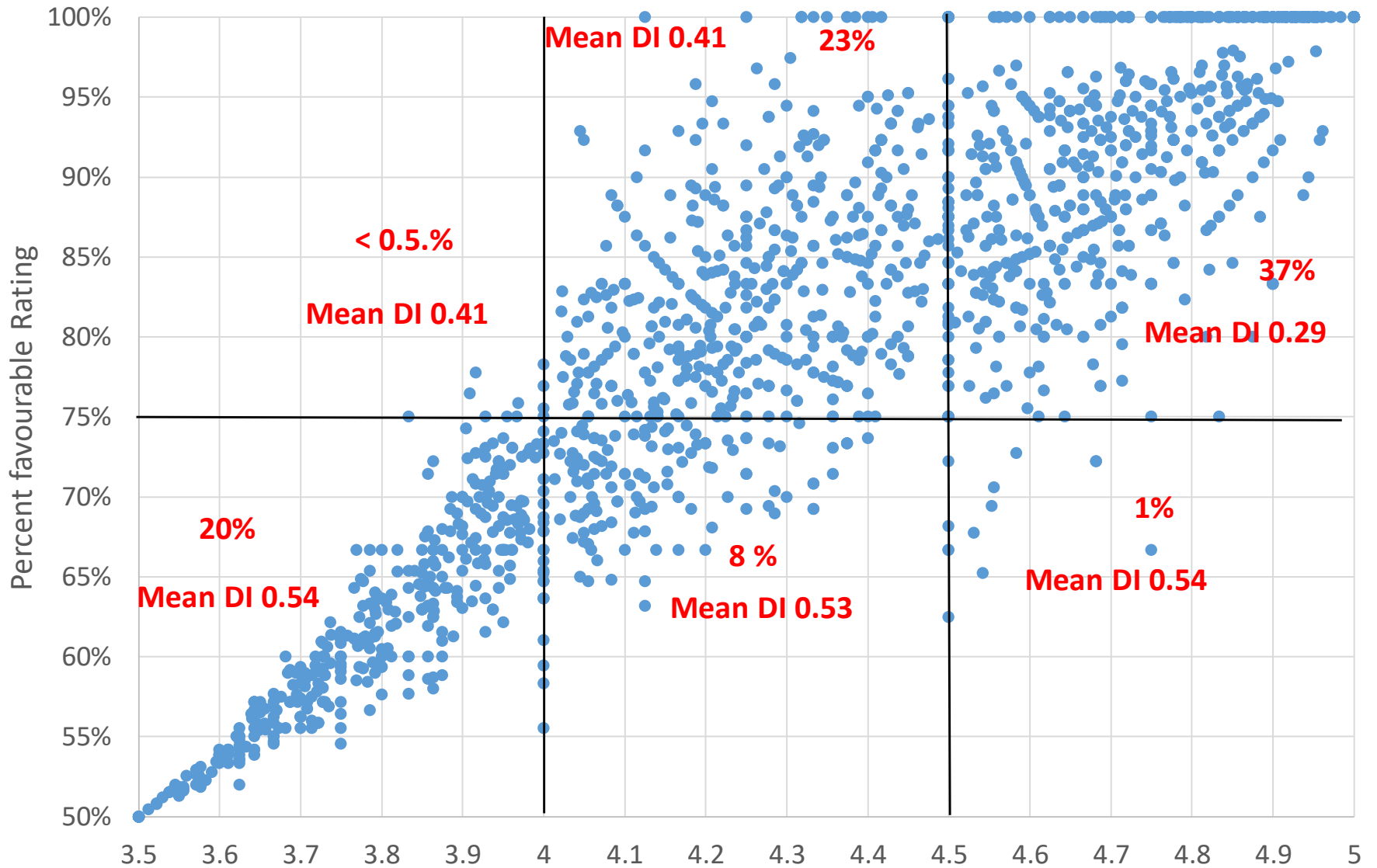
Interpolated Median

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

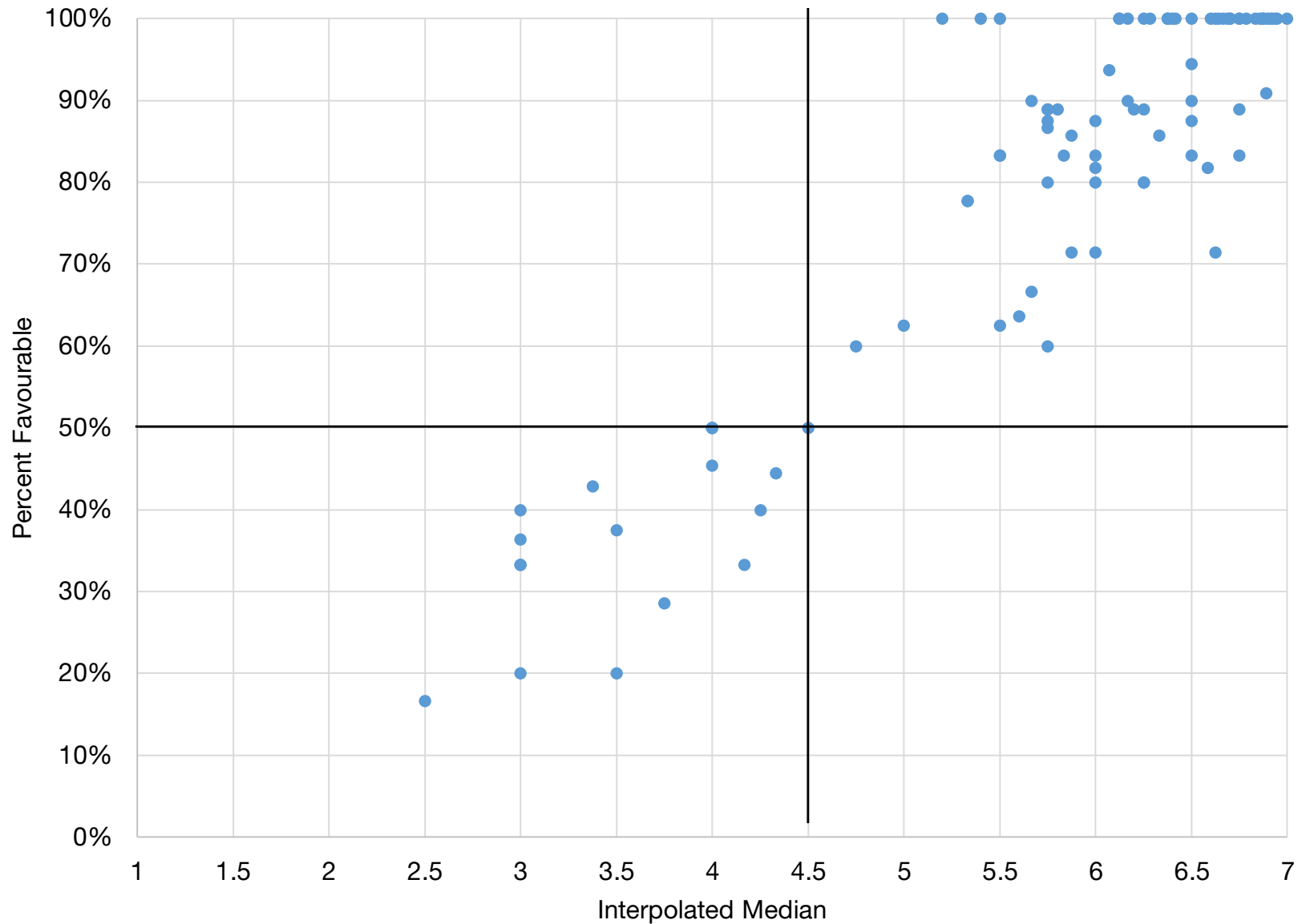
- Interpolated Median better reflects the distribution of students' responses than does the Mean or the Median.
- In particular, the Interpolated Median is more closely associated with percent favourable ratings.







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

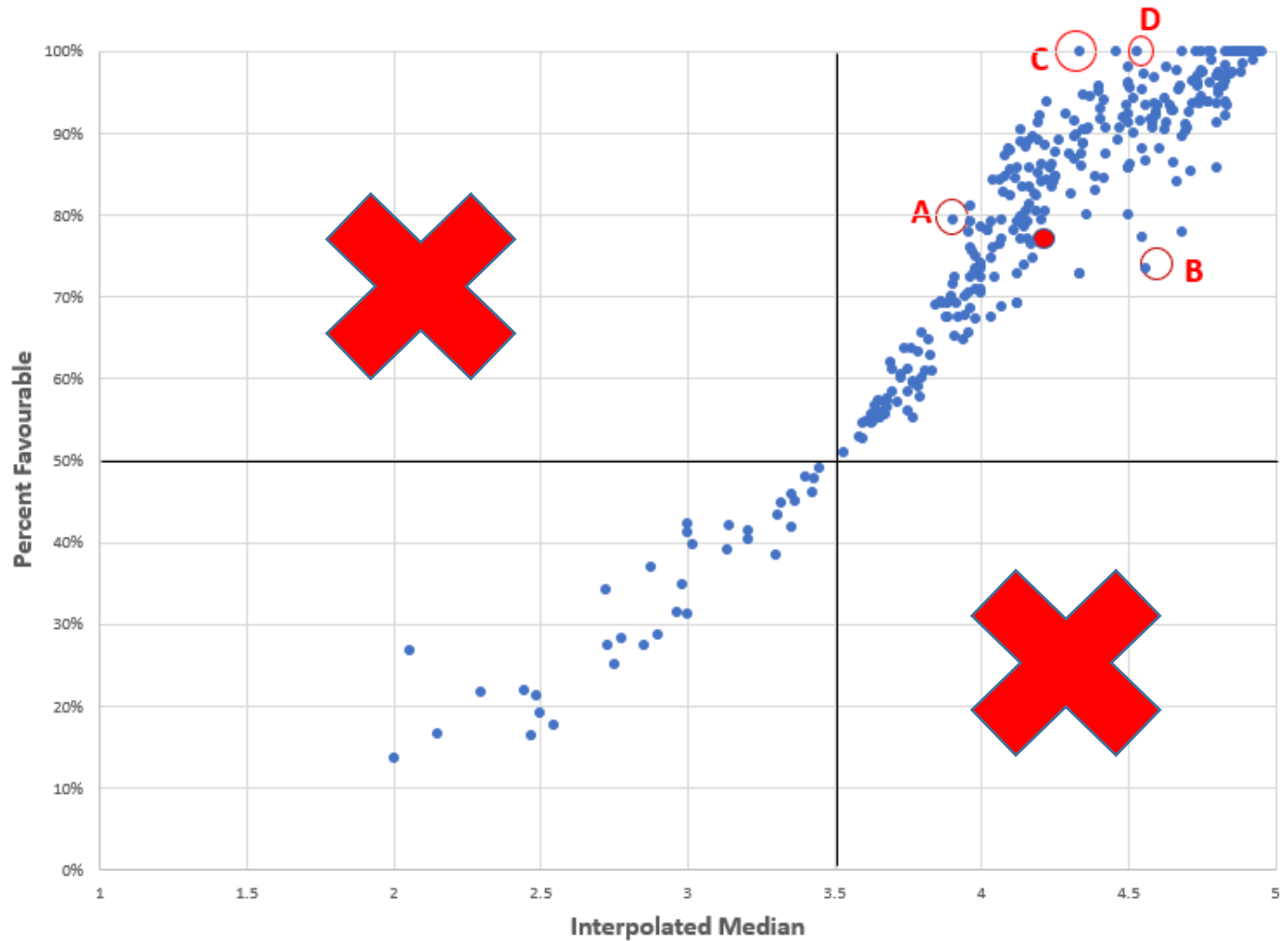
IM=4.6 % Fav.=73%
DI=0.57

Case C

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

Case D

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

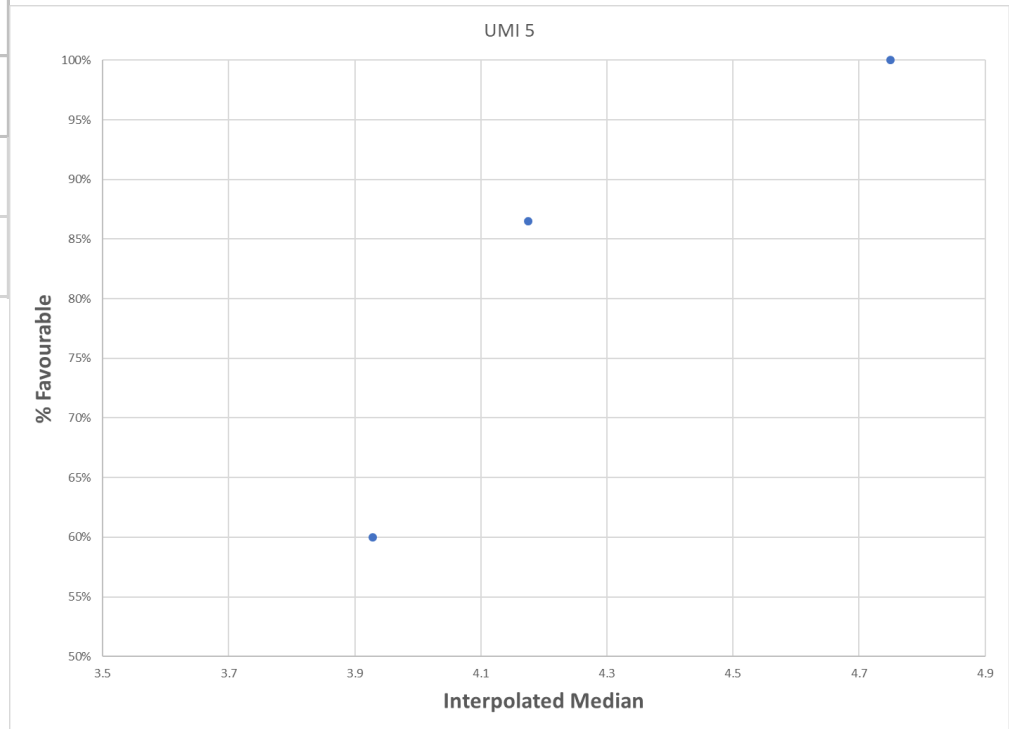


Activity

Room 1

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

IM	%Fav	DI
4.8	100%	0.22
4.2	86%	0.37
3.9	60%	0.75



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

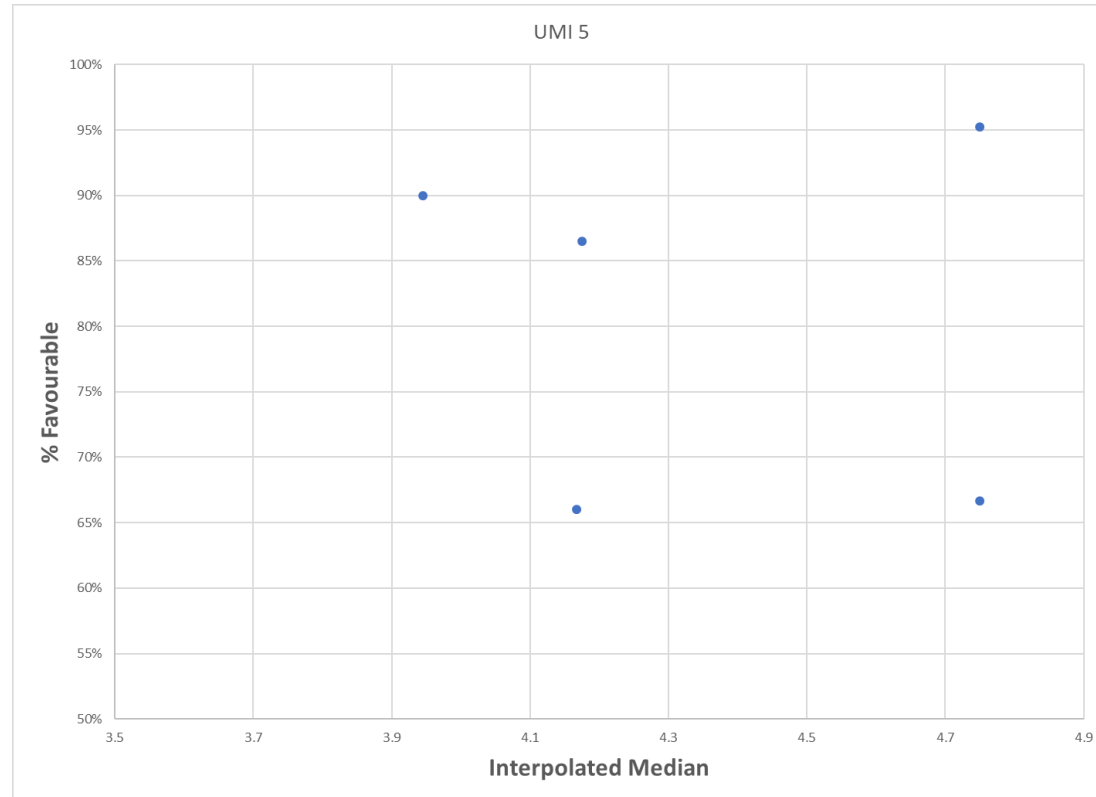
- a) The interpolated Median (IM) **only**
- b) % Favorable **only**
- c) **Both** IM and % Favourable

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

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) have?

Questions?

Thank You

Abdel Azim Zumrawi
Planning & Institutional Research (PAIR)

Email: abdel.azim.Zumrawi@ubc.ca



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