Descriptive Research Study

Investigation of Positive and Negative Affect of UniJos PhD Students toward their PhD Research Project

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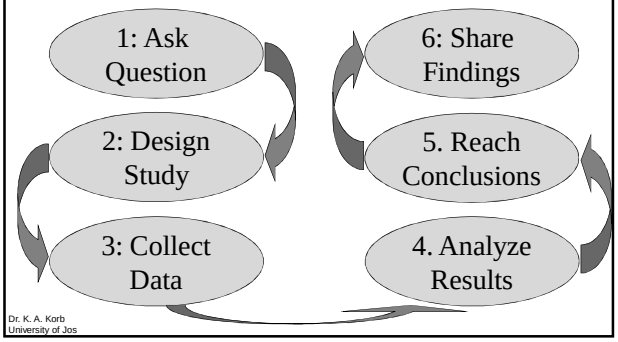
Scientific Method



1. Ask Question

- **General research question:** What is the attitude of PhD students at UniJos toward their PhD research project?
  - Specific research questions:
    - What is the level of positive affect that UniJos PhD students have toward their PhD research project?
    - What is the level of negative affect that UniJos PhD students have toward their PhD research project?

2. Design Study

- **Participants:** UniJos PhD students who attend the Research Seminar on 29 February, 2008.
- **Instruments:** PANAS Questionnaire (see next slide)
  - Previously designed and validated by other researchers.
  - Published in *Journal of Personality and Social Psychology*
- **Procedure:** Administer questionnaire to PhD students before the Research Seminar begins.

Questionnaire

Note the direction to *circle* the best response. Ticks can be confusing when trying to determine what was selected, but circling is unambiguous.

Part 1 requests demographic information.

Part 1

Please circle the response that best represents you.

1. Masters Student PhD Student Staff Other: _____

2. Male Female

3. Age: 20-29 30-39 40-49 50-59 60+

4. **For students**: How many years have you been enrolled in your program?

1 2 3 4 5 6 7 8 9 10+

Part 2

This scale consists of a number of words that describe different feelings and emotions. Read each item and then record the appropriate answer in the space next to that word. Indicate to what extent you feel this way when you think about working on your PhD Research Project. Use the following scale to record your answers.

1 very slightly or not at all — 2 a little — 3 moderately — 4 quite a bit — 5 extremely

___ interested
___ distressed

Part 2 is the PANAS scale of Positive and Negative Affect. Other researchers have developed and validated the PANAS (Watson, Clark, & Tellegren, 1988). Due to copyright, I cannot reproduce the entire questionnaire here, but it is free for anybody to use. See me and I can get the questionnaire to you if you are interested.

3: Collect Data

- Data was collected on 29 February 2008 when the questionnaire was administered.

4. Analyze Results

- Data was entered into an Excel Spreadsheet.
  - The next few slides outline how the results were analyzed.

The blue rows are the column headers that describe what data each column contains.

Each row is one participant's data.

Each column is all of the responses for one question on the questionnaire. I have highlighted question 10

This is the spreadsheet where I entered the data in Microsoft Excel.

Demographic				Questionnaire Items																	
Stu	Sex	Age	Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2,3	2	4	4	4	3	4	4	4	3	3	4	3	3	4	4	3	4	3	4	5	4	4	4
2	2	3	3	5	1	4	1	4	1	2	1	4	3	1	3	1	3	2	4	4	1	3	2
2	2	4	2	5	2	3	2	5	2	1	4	3	1	1	3	1	2	2	3	3	1	1	1
2	2	3	3	5	3	3	2	5	2	2	1	4	3	2	4	1	4	2	4	5	2	3	2
2	1	3	1	5	2	4	2	4	1	2	2	5	1	2	4	1	4	2	5	3	2	4	2
2	9	3	1	3	4	2	2	2	1	5	1	3	1	3	4	1	3	2	4	3	2	4	2
2	2	3	1	5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2
2	2	3	1	5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2
2	1	3	3	5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1
2	1	3	3	5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1
2	2	3	4	5	2	4	2	3	1	5	1	4	3	1	4	1	4	3	4	4	2	4	3
2,3	2	5	3	5	5	5	4	3	2	3	1	4	2	1	5	1	3	2	5	5	5	4	2
2	2	4	4	4	2	3	2	3	4	4	1	3	1	2	3	6	3	2	5	4	2	3	3
2	2	4	99	5	5	5	4	3	4	4	2	3	2	4	3	2	4	4	4	3	3	3	4

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Student:
1 is Masters
2 is PhD
3 is Staff

Sex:
1 is Male
2 is Female

Age:
1 is 20-29
2 is 30-39
3 is 40-49
4 is 50-59
5 is 60+

Years enrolled in program:
I typed the response circled. No code was necessary.

This participant did not give a response. Leaving blank cells can be confusing, so *9* is the value I used for a missing value.

The highlighted columns are demographic characteristics. I used a code to ease analysis.

Demographic				Questionnaire Items																	
Stu	Sex	Age	Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2,3	2	4	4	4	3	4	4	4	3	3	4	3	3	4	4	3	4	3	4	5	4	4	4
2	2	3	3	5	1	4	1	4	1	2	1	4	3	1	3	1	3	2	4	4	1	3	2
2	2	4	2	5	2	3	2	5	2	1	4	3	1	1	3	1	2	2	3	3	1	1	1
2	2	3	3	5	3	3	2	5	2	2	1	4	3	2	4	1	4	2	4	5	2	3	2
2	1	3	1	5	2	4	2	4	1	2	2	5	1	2	4	1	4	2	5	3	2	4	2
2	9	3	1	3	4	2	2	2	1	5	1	3	1	3	4	1	3	2	4	3	2	4	2
2	2	3	1	5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2
2	2	3	1	5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2
2	1	3	3	5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1
2	1	3	3	5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1
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2,3	2	5	3	5	5	5	4	3	2	3	1	4	2	1	5	1	3	2	5	5	5	4	2
2	2	4	4	4	2	3	2	3	4	4	1	3	1	2	3	5	3	2	5	4	2	3	3
2	2	4	99	5	5	5	4	3	4	4	2	3	2	4	3	2	4	4	4	3	3	3	4

Since 9 is a valid response to years enrolled, *99* is the missing value here.

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The highlighted columns are the responses for each question on the questionnaire. I typed the number that each participant wrote for each question.

Demographic				Questionnaire Items																	
Stu	Sex	Age	Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2,3	2	4	4	4	3	4	4	4	3	3	4	3	3	4	4	3	4	3	4	5	4	4	4
2	2	3	3	5	1	4	1	4	1	2	1	4	3	1	3	1	3	2	4	4	1	3	2
2	2	4	2	5	2	3	2	5	2	1	4	3	1	1	3	1	2	2	3	3	1	1	1
2	2	3	3	5	3	3	2	5	2	2	1	4	3	2	4	1	4	2	4	5	2	3	2
2	1	3	1	5	2	4	2	4	1	2	2	5	1	2	4	1	4	2	5	3	2	4	2
2	9	3	1	3	4	2	2	2	1	5	1	3	1	3	4	1	3	2	4	3	2	4	2
2	2	3	1	5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2
2	2	3	1	5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2
2	1	3	3	5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1
2	1	3	3	5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1
2	2	3	4	5	2	4	2	3	1	5	1	4	3	1	4	1	4	3	4	4	2	4	3
2,3	2	5	3	5	5	5	4	3	2	3	1	4	2	1	5	1	3	2	5	5	5	4	2
2	2	4	4	4	2	3	2	3	4	4	1	3	1	2	3	5	3	2	5	4	2	3	3
2	2	4	99	5	5	5	4	3	4	4	2	3	2	4	3	2	4	4	4	3	3	3	4

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Demographics

I counted up the frequency that each demographic was selected in the questionnaires and made these frequency charts.

Two people selected two options in this category. Otherwise all values should add up to 14, the number of participants.

The *countif* function in Excel can count each code for you.

University Status	
Masters	0
PhD	14
Staff	2
Other	0

Gender	
Male	3
Female	10
Missing	1

Age	
20-29	0
30-39	0
40-49	9
50-59	4
60+	1

Years in Program	
1	4
2	1
3	5
4	3
Missing	1

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- On the questionnaire, items 1, 3, 5, 9, 10, 12, 14, 16, 17, and 19 measured *Positive Affect.*
  - For each participant, I added the responses for these items to get a grand total for *Positive Affect.*

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I added up the responses for each participant in blue to get an overall Positive Affect (PA) score in green.

Questionnaire Items																			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	PA
4	3	4	4	4	3	3	4	3	3	4	4	3	4	3	4	5	4	4	4	39
5	1	4	1	4	1	2	1	4	3	1	3	1	3	2	4	4	1	3	2	37
5	2	3	2	5	2	1	4	3	1	1	3	1	2	2	3	3	1	1	1	29
5	3	3	2	5	2	2	1	4	3	2	4	1	4	2	4	5	2	3	2	40
5	2	4	2	4	1	2	2	5	1	2	4	1	4	2	5	3	2	4	2	39
3	4	2	2	2	1	5	1	3	1	3	4	1	3	2	4	3	2	4	2	29
5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2	37
5	2	3	2	3	4	2	1	4	3	3	4	1	3	4	5	4	4	3	2	37
5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1	38
5	2	3	1	3	1	1	2	4	5	1	2	1	3	1	4	5	2	4	1	38
5	2	4	2	3	1	5	1	4	3	1	4	1	4	3	4	4	2	4	3	39
5	5	5	4	3	2	3	1	4	2	1	5	1	3	2	5	5	5	4	2	41
4	2	3	2	3	4	4	1	3	1	2	3	5	3	2	5	4	2	3	3	32
5	5	5	4	3	4	4	2	3	2	4	3	2	4	4	4	3	3	3	4	35

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- On the questionnaire, items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20 measured *Negative Affect.*
  - For each participant, I added the responses for these items to get a grand total for *Negative Affect.*

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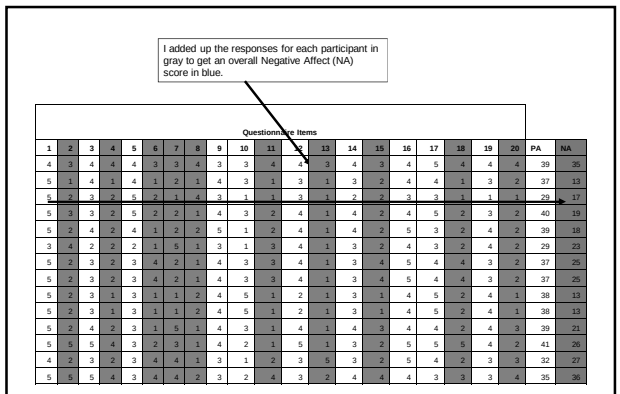

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- Now that I have grand scores for *Positive Affect* and *Negative Affect,* I want to know what the average scores for both construct are. By averaging the scores, I will then be able to interpret the scores on the Likert scale that was originally administered.
  - To do this, I divided the total *Positive Affect* and total *Negative Affect* scores by 10, the number of items that measure each construct.
  - By adding up the scores and dividing by the number of scores, I am in effect calculating the mean score for each construct.

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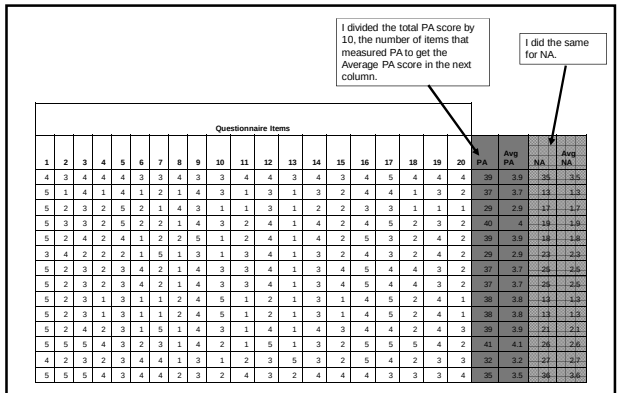

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- The average (Avg) PA and NA scores can now be interpreted on the Likert scale, i.e. an average score of 3.6 is midway between having *moderate* Positive Affect and *quite a bit* of Positive Affect.
  - 1 is low PA or NA
  - 5 is high PA or NA
  - 3 is average.
- Now that I have average PA and NA scores for each participant, I want to know the average PA and NA score for my overall sample.

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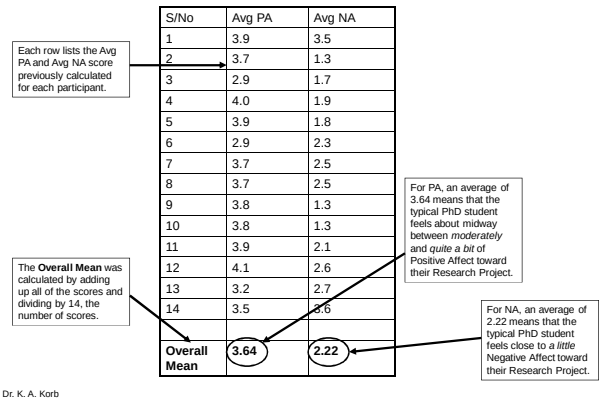

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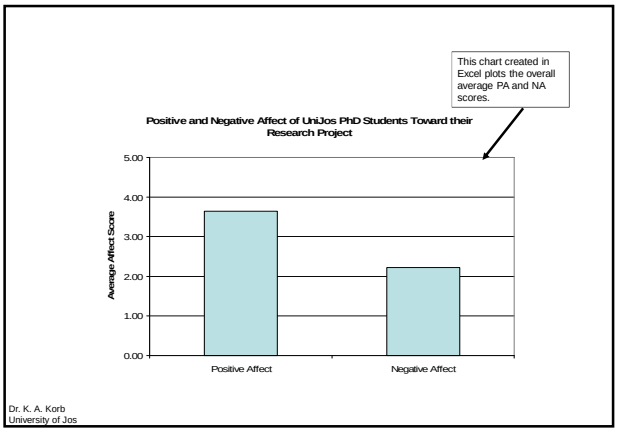

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- Now that I have analyzed the Positive and Negative Affect for PhD students overall, I would like to compare Positive and Negative Affect by the demographic characteristics that I assessed.
- When comparing results by demographic characteristics, this study turns into a *Causal-Comparative* Research Design (a subset of the Descriptive design) because I will be comparing PA and NA between naturally occurring variables (e.g., sex and age)

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I first wanted to compare PA and NA by sex. I sorted the data so all of the male data (coded as 1) and female data (coded as 2) were together.

	Demographic			Average Affect Scores	
Stu	Sex	Age	Yrs	Avg PA	Avg NA
2	1	3	1	3.9	1.8
2	1	3	3	3.8	1.3
2	1	3	3	3.8	1.3
2	2	3	1	3.7	2.5
2	2	3	1	3.7	2.5
2	2	4	2	2.9	1.7
2	2	3	3	3.7	1.3
2	2	3	3	4	1.9
2,3	2	5	3	4.1	2.6
2	2	3	4	3.9	2.1
2,3	2	4	4	3.9	3.5
2	2	4	4	3.2	2.7
2	2	4	99	3.5	3.6
2	9	3	1	2.9	2.3

Next, I calculated the mean PA and NA score within sex. In other words, I added up the 3 PA scores for the men and divided by 3 (the number of male scores). Likewise, I added up the female PA scores and divided by 10 (the number of female scores).

The 9 means that this person did not record their sex. Since I don't know whether this person was male or female, I do not include their data in this analysis.

These are the average scores for males vs. females.

	Positive Affect	Negative Affect
Male	3.83	1.47
Female	3.66	2.44
t-test (*p*)	0.45	0.05

To determine whether the differences between the scores are statistically significant and not due to chance, I conducted a t-test to compare scores between males and females.

The standard for determining statistical significance is a *p* value less than .05. This value of .05 therefore is statistically significant, meaning that the difference between the average male and female NA score is not likely due to chance.

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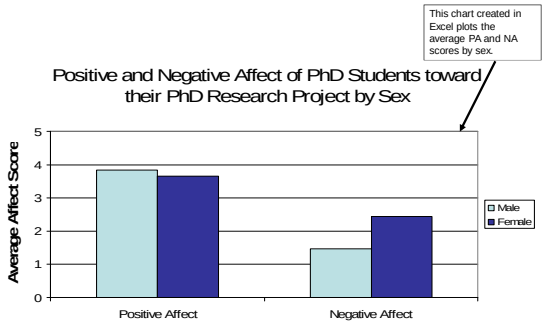

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I next wanted to compare PA and NA by age. I sorted the data by age. 3 means 40-49, 4 means 50-59, and 5 means 60+. Since there was only 1 person 60+, I decided to create 2 categories: 40-49 (coded 3) and 50+ (coded 4 and 5).

	Demographic			Average Affect Scores	
Stu	Sex	Age	Yrs	Avg PA	Avg NA
2	1	3	1	3.9	1.8
2	1	3	3	3.8	1.3
2	1	3	3	3.8	1.3
2	2	3	1	3.7	2.5
2	2	3	1	3.7	2.5
2	2	3	3	3.7	1.3
2	2	3	3	4	1.9
2	2	3	4	3.9	2.1
2	9	3	1	2.9	2.3
2	2	4	2	2.9	1.7
2,3	2	4	4	3.9	3.5
2	2	4	4	3.2	2.7
2	2	4	99	3.5	3.6
2,3	2	4	3	4.1	2.6

Next, I calculated the mean PA and NA score by age.

These are the average scores within each age group.

	Positive Affect	Negative Affect
40-49 years	3.71	1.89
50+ years	3.52	2.82
t-test (*p*)	0.39	0.02

I again determined whether differences between the mean scores were statistically significant by conducting a t-test.

The *p* of .02 is statistically significant, meaning that PhD students 50+ years old have significantly more NA than those 40-49.

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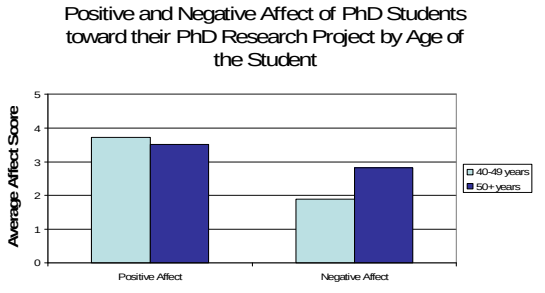

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- Since the differences in Negative Affect scores between males and females were different, we might be tempted to conclude that being female *causes* increased Negative Affect toward the PhD research project.
- Likewise, we might also be tempted to conclude that being older *causes* increased Negative Affect toward the PhD research project.
- However, you CANNOT do this. See the next slide to find out why.

Note that the 3 males all happen to be in the 40-49 age category.

However, the females are spread out in all 3 age categories.

	Demographic			Average Affect Scores	
Stu	Sex	Age	Yrs	Avg PA	Avg NA
2	1	3	1	3.9	1.8
2	1	3	3	3.8	1.3
2	1	3	3	3.8	1.3
2	1	4	1	3.7	2.5
2	1	4	1	3.7	2.5
2	1	4	3	3.7	1.3
2	1	4	3	4	1.9
2	1	4	4	3.9	2.1
2	1	4	2	2.9	1.7
2,3	1	4	4	3.9	3.5
2	1	4	4	3.2	2.7
2	1	4	99	3.5	3.6
2,3	1	4	3	4.1	2.6
2	9	3	1	2.9	2.3

Because the lower NA scores are associated with male students and students in the lower age bracket, AND because all 3 males are also in the lowest age bracket, we cannot determine whether the Negative Affect scores are *caused* by sex or by age. This is why we cannot make causal statements with a descriptive research design.

Finally, I wanted to compare PA and NA by years enrolled in the PhD program so I sorted the scores by Yrs. I decided to group the participants by those in the program 1-2 years and those in the program 3-4 years.

Next, I calculated the mean PA and NA score by years in the program.

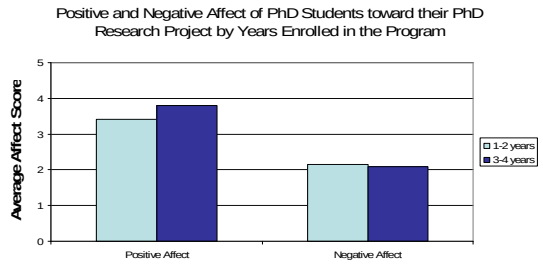
The 99 means that this person did not record their years in the program. Therefore, their scores were not included in this analysis.

These are the average scores for each set of years in the program.

I again determined whether differences between the mean scores were statistically significant by conducting a t-test. Since the *p* values were greater than .05, there were no statistically significant differences.

	Demographic			Average Affect Scores	
Stu	Sex	Age	Yrs	Avg PA	Avg NA
2	1	3	1	3.9	1.8
2	2	3	1	3.7	2.5
2	2	3	1	3.7	2.5
2	9	3	1	2.9	2.3
2	2	4	2	2.9	1.7
2	1	3	3	3.8	1.3
2	1	3	3	3.8	1.3
2	2	3	3	3.7	1.3
2	2	3	3	4	1.9
2,3	2	5	3	4.1	2.6
2	2	3	4	3.9	2.1
2,3	2	4	4	3.9	3.5
2	2	4	4	3.2	2.7
2	2	4	99	3.5	3.6

	Positive Affect	Negative Affect
1-2 years	3.42	2.16
3-4 years	3.80	2.09
t-test	0.09	0.86



5: Reach Conclusions

- Conclusions
  - Describing the current state of Affect by overall mean scores:
    - The typical PhD student at UniJos feels quite a bit of Positive Affect toward their Research Project.
    - The typical PhD student at UniJos feels little Negative Affect toward their Research Project.
  - Comparing the current state of Affect by demographic characteristics:
    - Female students tend to feel slightly more Negative Affect toward their Research Project than males.
    - Older students tend to feel slightly more Negative Affect toward their Research Projects than younger students.
    - There were no significant differences in Negative Affect by years enrolled in the PhD program.
    - There were no significant differences in Positive Affect for any of the demographic characteristics.

6: Share Findings

- In my write-up for this research study, I would need to include the following information in the *Methods* section.
  - Participants
    - 14 PhD students at UniJos
    - Sex:
      - Male: 3
      - Female: 10
      - Missing: 1
    - Age:
      - 40-49: 9
      - 50-59: 4
      - 60+: 1
    - Years enrolled in program:
      - 1 year: 4
      - 2 years: 1
      - 3 years: 5
      - 4 years: 3
      - Missing: 1

6: Share Findings

- **Methods Section, Continued**
- **Research Design:** Descriptive
  - Describing a phenomenon as it is
- **Instrument:** PANAS (Positive and Negative Affect Scale)
  - **Measures two affective state dimensions**
    - **Positive affect – the state of high energy, full concentration, and pleasurable engagement**
    - **Negative affect – the state of unpleasurable engagement and distress**
  - **Participants responded to how they feel when think about working on their PhD Research Project**
    - **10 items for Positive Affect**
    - **10 items for Negative Affect**
    - **5-point Likert scale from 1 (very slightly) to 5 (extremely)**
  - Developed and validated by Watson, Clark, and Tellegren (1988)

6: Share Findings

- **Methods Section, Concluded**
- **Procedure:**
  - Administer PANAS before PhD Research Seminar
- **Data Analysis:**
  - Mean for Positive Affect and Negative Affect
  - Calculated mean of PA and NA by demographic groups
    - Compared means by demographic group by t-test

6: Share Findings

- Results
  - In the *Results* section, I would include the tables with mean values (for the sample overall in addition to sex, age, and years enrolled) as well as the charts.
  - I also need to include the standard deviation of scores for each mean value so the readers will know how much variation there is.

6: Share Findings

Calculating the Standard Deviation

1. Subtract each score from the mean. (This gives you the *deviation*.)
2. Square each deviation.
3. Add up the squared deviations.
4. Divide the sum by total number of scores.
5. Take the the square root of the product.

Therefore, the Standard Deviation is the square root of the average deviation.

Here I calculated the Standard Deviation (SD) for NA. The average NA score was 2.2.

First subtract each NA score from the mean of 2.2 (1.8 - 2.2 = -0.4)

Next square each deviation (-0.4 * -0.4 = 0.16)

Now add up all of the squared deviations (i.e., 0.16 + 0.09 + 0.09 + 0.01 + …)

Divide the sum by 14, the number of scores.

Finally, take the square root of the Avg. Deviation to get the SD.

Average Affect Scores		Standard Deviation Calculations	
Avg PA	Avg NA	Deviation	Dev Squared
3.9	1.8	-0.4	0.16
3.7	2.5	0.3	0.09
3.7	2.5	0.3	0.09
2.9	2.3	0.1	0.01
2.9	1.7	-0.5	0.25
3.8	1.3	-0.9	0.81
3.8	1.3	-0.9	0.81
3.7	1.3	-0.9	0.81
4	1.9	-0.3	0.09
4.1	2.6	0.4	0.16
3.9	2.1	-0.1	0.01
3.9	3.5	1.3	1.69
3.2	2.7	0.5	0.25
3.5	3.6	1.4	1.96
		Sum	7.19
		Avg Dev	0.51
		SD	0.72

I calculated the standard deviation of the Avg scores for PA and NA separately. Once I calculated the standard deviations for the overall sample for PA and NA, I sorted the data by Sex, Age, and Yrs to find the standard deviations for those demographics. This procedure was similar to the procedure for calculating the average PA and NA scores.

Demographic				Average Affect Scores	
Stu	Sex	Age	Yrs	Avg PA	Avg NA
2	1	3	1	3.9	1.8
2	2	3	1	3.7	2.5
2	2	3	1	3.7	2.5
2	9	3	1	2.9	2.3
2	2	4	2	2.9	1.7
2	1	3	3	3.8	1.3
2	1	3	3	3.8	1.3
2	2	3	3	3.7	1.3
2	2	3	3	4	1.9
2,3	2	5	3	4.1	2.6
2	2	3	4	3.9	2.1
2,3	2	4	4	3.9	3.5
2	2	4	4	3.2	2.7
2	2	4	99	3.5	3.6

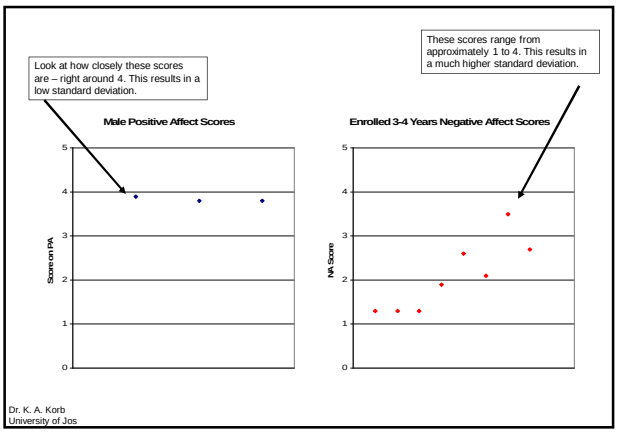
6: Share Findings

These are the standard deviations for each demographic where I reported a mean.

This low standard deviation means that there was very little variation in PA scores for the males (see next slide).

This large score means that there were great differences between NA scores for those enrolled in the program for 3-4 years (see next slide).

	Positive Affect	Negative Affect
Overall	0.38	0.72
Male	0.06	0.29
Female	0.37	0.73
40-49 years	0.32	0.50
50+	0.49	0.77
1-2 years	0.48	0.38
3-4 years	0.27	0.80



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6: Share Findings

- Discussion
  - In the *Discussion* section, I would discuss the conclusions that I reached in Step 5.
  - I should also include *Implications* of the research, *Limitations* of the study, and *Directions for Future Research.*
    - *Implications:* Supervisors should pay careful attention to the distress level of female and older students and provide additional support when necessary.
    - *Limitations:* Small sample size and is limited to ASSE students.
    - *Directions for Future Research:* Conduct a similar study with a broader range of departments; Examine whether counseling interventions decrease Negative Affect

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