



# Introduction to SPSS

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Why n' How

February 19, 2009



# Overview

- Setting up a data file
- Frequencies/Descriptives
- One-sample T-test
- Paired-samples T-test
- Independent-samples T-test
- One-way ANOVA



# Study

- Three Diagnostic Groups
  - MDD, Bipolar, and Dysthymia
- Subjects receive either Drug or Placebo
- Measure of success:
  - Beck Depression Inventory (BDI) score
- BDI Assessed at 3 points:
  - Pre Treatment
  - After 4 Weeks
  - After 8 Weeks





# Setting Up A Data File

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1	ID	String	200	0	Subject ID	None		8	Left	Nominal
2	Dx	Numeric	8	2	Diagnosis Group	None	None	8	Right	Scale
3	TxGroup	Numeric	8	2	Drug or Placebo?	None	None	8	Right	Scale
4	Sex	Numeric	8	2	Sex	None	None	8	Right	Scale
5	Education	Numeric	8	2	Years of Education	None	None	8	Right	Scale
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	None	8	Right	Scale
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	None	8	Right	Scale
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	None	8	Right	Scale
9										
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20										
21										

Important: Always Use Labels

Data View Variable View

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:33 AM



# Setting Variable Types

SPSS Statistics Data Editor window showing variable definitions. The 'Variable Type' dialog box is open for the 'ID' variable, with 'String' selected and 'Characters' set to 200.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1	ID	String	200	0	Subject ID	None		8	Left	Nominal
2	Dx	Numeric	8	2	Diagnosis Group	None	None	8	Right	Scale
3	TxGroup	Numeric	8	2	Drug or Placebo?	None	None	8	Right	Scale
4	Sex	Numeric	8	2	Sex	None	None	8	Right	Scale
5	Education	Numeric	8	2	Years of Education	None	None	8	Right	Scale
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	None	8	Right	Scale
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	None	8	Right	Scale
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	None	8	Right	Scale

**Variable Type** dialog box:

- Numeric
- Comma Characters: 200
- Dot
- Scientific notation
- Date
- Dollar
- Custom currency
- String

Buttons: OK, Cancel, Help



# Setting Value Labels

The screenshot displays the SPSS Statistics Data Editor interface. The main window shows the Variable View for a dataset named 'Untitled1 [DataSet0]'. The variables listed are:

Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1 ID	String	200	0	Subject ID	None	None	8	Left
2 Dx	Numeric	8	2	Diagnosis Group	None	None	8	Right
3 TxGroup	Numeric	8	2	Drug or Placebo?	None	None	8	Right
4 Sex	Numeric	8	2	Sex	None	None	8	Right
5 Education	Numeric	8	2	Years of Education	None	None	8	Right
6 BDIpre	Numeric	8	2	BDI score Before Treatment	None	None	8	Right
7 BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	None	8	Right
8 BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	None	8	Right

The 'Value Labels' dialog box is open, showing the following configuration:

- Value: 3
- Label: Dysthymic
- Existing labels: 1.00 = "MDD", 2.00 = "Bipolar"

The dialog box includes buttons for 'Add', 'Change', 'Remove', 'Spelling...', 'OK', 'Cancel', and 'Help'. The 'Variable View' tab is selected at the bottom of the SPSS window.



# Setting Value Labels

The screenshot shows the SPSS Statistics Data Editor interface. The main window displays a list of variables with their properties. The 'TxGroup' variable is highlighted in blue. A 'Value Labels' dialog box is open, showing the 'Value' field set to '2' and the 'Label' field set to 'Placebo'. A list box below contains the entry '1.00 = "Drug"'. A green arrow points from the text 'Important: THESE VALUES ARE ARBITRARY!!' to the '1.00 = "Drug"' entry in the list box.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	≡ Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	None	8	≡ Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	None	None	8	≡ Right
4	Sex	Numeric	8	2	Sex	None	None	8	≡ Right
5	Education	Numeric	8	2	Years of Education	None	None	8	≡ Right
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	None	8	≡ Right
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	None	8	≡ Right
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	None	8	≡ Right

**Value Labels**

Value: 2

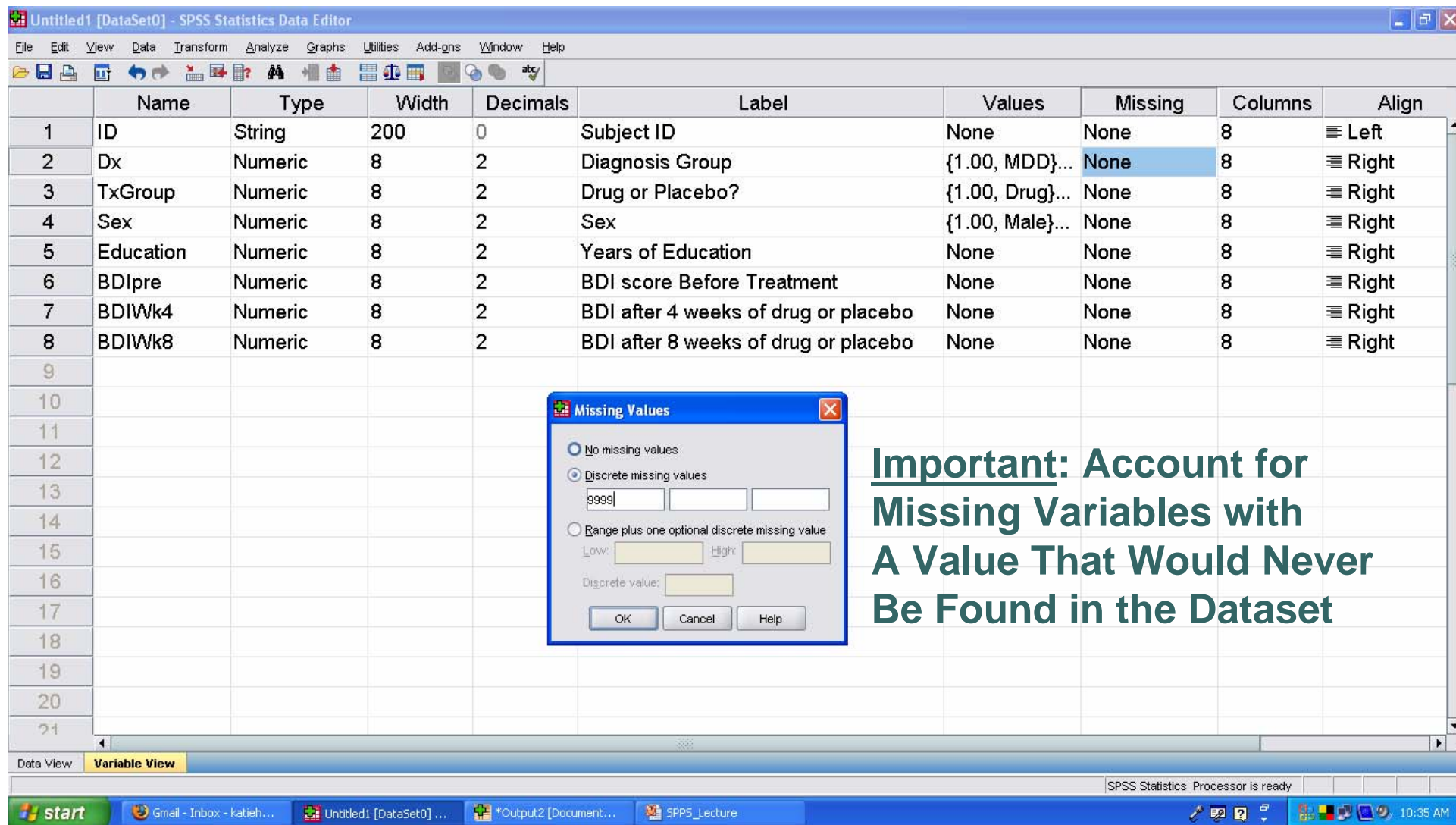
Label: Placebo

1.00 = "Drug"

**Important: THESE VALUES ARE ARBITRARY!!**



# Accounting for Missing Variables



The screenshot displays the SPSS Statistics Data Editor interface. The main window shows a list of variables in Variable View. A dialog box titled "Missing Values" is open, showing the "Discrete missing values" option selected with the value "9999" entered. To the right of the dialog box, a text box contains the following text:

**Important: Account for Missing Variables with A Value That Would Never Be Found in the Dataset**

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	≡ Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	None	8	≡ Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	None	8	≡ Right
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	None	8	≡ Right
5	Education	Numeric	8	2	Years of Education	None	None	8	≡ Right
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	None	8	≡ Right
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	None	8	≡ Right
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	None	8	≡ Right
9									
10									
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15									
16									
17									
18									
19									
20									
21									

The "Missing Values" dialog box shows the following options:

- No missing values
- Discrete missing values  
9999
- Range plus one optional discrete missing value  
Low: High: Discrete value:

Buttons: OK, Cancel, Help



# Setting Up A Date File

SPSS Statistics Data Editor window showing the Variable View of a dataset. The window title is "Untitled1 [DataSet0] - SPSS Statistics Data Editor". The menu bar includes File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains various icons for file operations and data manipulation.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	≡ Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	9999.00	8	≡ Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	9999.00	8	≡ Right
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	9999.00	8	≡ Right
5	Education	Numeric	8	2	Years of Education	None	9999.00	8	≡ Right
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	9999.00	8	≡ Right
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	9999.00	8	≡ Right
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	9999.00	8	≡ Right
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									

The Variable View tab is selected at the bottom of the window. The status bar at the bottom indicates "SPSS Statistics Processor is ready". The Windows taskbar at the very bottom shows the Start button and several open applications: Gmail - Inbox - katieh..., Untitled1 [DataSet0] ..., \*Output2 [Document...], and SPPS\_Lecture. The system clock shows 10:36 AM.



# Setting Up A Data File

The screenshot shows the SPSS Statistics Data Editor interface. The title bar reads "Untitled1 [DataSet0] - SPSS Statistics Data Editor". The menu bar includes File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains various icons for file operations and data manipulation. The main window displays a variable view table with the following columns: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, var, var, var, var, and var. The rows are numbered 1 through 19. Two green arrows point from the text "New Variable Labels Will Appear Up Top" to the TxGroup and BDIWk4 columns. A blue rectangular highlight is visible in the row 6, column 9 cell. The status bar at the bottom indicates "SPSS Statistics Processor is ready". The Windows taskbar at the very bottom shows the Start button and several open applications: Gmail - Inbox - katieh..., Untitled1 [DataSet0]..., \*Output2 [Document...], and SPPS\_Lecture. The system clock shows 10:36 AM.

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													

**New Variable Labels Will Appear Up Top**



# Setting Up A Data File

SPSS Statistics Data Editor window showing a dataset with 19 rows and 13 columns. The columns are: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, var, var, var, var, var. The data is as follows:

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	1.00	1.00	1.00	12.00	63.00	30.00	8.00					
2	Subject10	2.00	1.00	2.00	15.00	57.00	53.00	52.00					
3	Subject11	2.00	2.00	2.00	16.00	39.00	41.00	40.00					
4	Subject12	3.00	2.00	2.00	19.00	38.00	36.00	35.00					
5	Subject13	3.00	2.00	1.00	18.00	41.00	40.00	41.00					
6	Subject14	3.00	2.00	2.00	18.00	30.00	34.00	35.00					
7	Subject15	2.00	2.00	1.00	11.00	62.00	56.00	57.00					
8	Subject16	1.00	2.00	2.00	16.00	60.00	50.00	55.00					
9	Subject17	3.00	2.00	2.00	17.00	39.00	39.00	39.00					
10	Subject18	1.00	2.00	1.00	12.00	55.00	56.00	55.00					
11	Subject19	2.00	2.00	2.00	17.00	53.00	50.00	50.00					
12	Subject2	1.00	1.00	1.00	12.00	61.00	28.00	5.00					
13	Subject20	3.00	1.00	1.00	18.00	41.00	8.00	9.00					
14	Subject21	2.00	1.00	2.00	15.00	59.00	50.00	51.00					
15	Subject22	2.00	1.00	2.00	16.00	42.00	43.00	40.00					
16	Subject23	2.00	2.00	1.00	16.00	52.00	50.00	50.00					
17	Subject24	3.00	1.00	1.00	16.00	40.00	0.00	2.00					
18	Subject3	1.00	1.00	1.00	10.00	59.00	5.00	9.00					
19	Subject4	1.00	1.00	1.00	15.00	47.00	22.00	2.00					

The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, Help), a toolbar, and a status bar at the bottom showing 'SPSS Statistics Processor is ready' and the system clock '10:37 AM'.



# Viewing Value Labels

The screenshot shows the SPSS Statistics Data Editor interface. The 'View' menu is open, and the 'Value Labels' option is highlighted. The data grid displays 19 rows of data with columns for TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, and several unlabeled variables (var). The status bar at the bottom indicates 'SPSS Statistics Processor is ready' and the system clock shows 10:37 AM.

	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	1.00	1.00	12.00	63.00	30.00	8.00					
2	1.00	2.00	15.00	57.00	53.00	52.00					
3	2.00	2.00	16.00	39.00	41.00	40.00					
4	2.00	2.00	19.00	38.00	36.00	35.00					
5	2.00	1.00	18.00	41.00	40.00	41.00					
6	3.00	2.00	18.00	30.00	34.00	35.00					
7	2.00	2.00	11.00	62.00	56.00	57.00					
8	1.00	2.00	16.00	60.00	50.00	55.00					
9	3.00	2.00	17.00	39.00	39.00	39.00					
10	1.00	2.00	12.00	55.00	56.00	55.00					
11	2.00	2.00	17.00	53.00	50.00	50.00					
12	1.00	1.00	12.00	61.00	28.00	5.00					
13	3.00	1.00	18.00	41.00	8.00	9.00					
14	2.00	1.00	15.00	59.00	50.00	51.00					
15	2.00	1.00	16.00	42.00	43.00	40.00					
16	2.00	2.00	16.00	52.00	50.00	50.00					
17	3.00	1.00	16.00	40.00	0.00	2.00					
18	1.00	1.00	10.00	59.00	5.00	9.00					
19	1.00	1.00	15.00	47.00	22.00	2.00					



# Viewing Value Labels

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

Visible: 8 of 8 Variables

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00					
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00					
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00					
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00					
5	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00					
6	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00					
7	Subject15	Biploar	Placebo	Male	11.00	62.00	56.00	57.00					
8	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00					
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00					
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00					
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00					
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00					
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00					
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00					
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00					
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00					
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00					
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00					
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00					

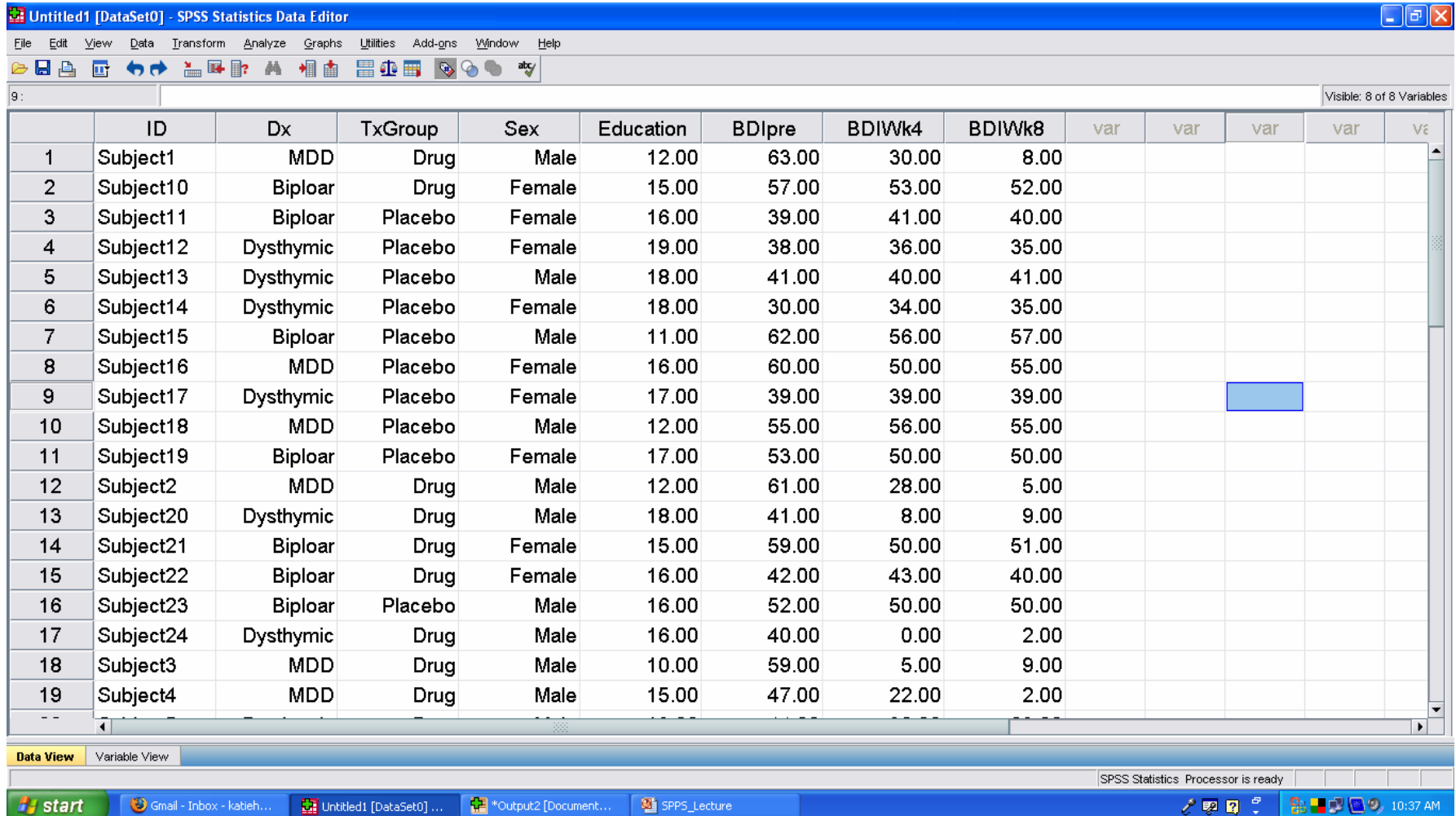
Data View Variable View

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:37 AM

# Now we have our data set up

## *What can we do with it???*



SPSS Statistics Data Editor window showing a dataset with 19 subjects and 13 variables. The variables are ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, and four unnamed variables labeled 'var'.

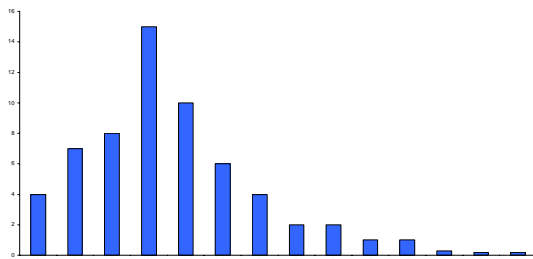
	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00					
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00					
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00					
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00					
5	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00					
6	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00					
7	Subject15	Biploar	Placebo	Male	11.00	62.00	56.00	57.00					
8	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00					
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00					
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00					
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00					
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00					
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00					
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00					
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00					
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00					
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00					
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00					
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00					



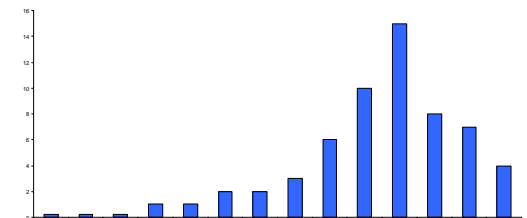
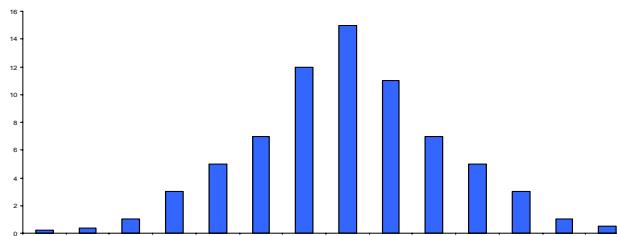
# Descriptives

- Mean
- Median
- Mode
- Range
- Skewness
  - Measure of the asymmetry of the probability distribution
  - Good way to check for outliers

## Negative Skew



## Positive Skew







# Running Descriptives

The screenshot shows the SPSS Statistics Data Editor interface. The 'Analyze' menu is open, and 'Frequencies...' is selected. The data table below shows the following variables and values:

ID	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1 Subject1	12.00	63.00	30.00	8.00					
2 Subject10	15.00	57.00	53.00	52.00					
3 Subject11	16.00	39.00	41.00	40.00					
4 Subject12	19.00	38.00	36.00	35.00					
5 Subject13	18.00	41.00	40.00	41.00					
6 Subject14	18.00	30.00	34.00	35.00					
7 Subject15	11.00	62.00	56.00	57.00					
8 Subject16	16.00	60.00	50.00	55.00					
9 Subject17	17.00	39.00	39.00	39.00					
10 Subject18	12.00	55.00	56.00	55.00					
11 Subject19	17.00	53.00	50.00	50.00					
12 Subject2	12.00	61.00	28.00	5.00					
13 Subject20	18.00	41.00	8.00	9.00					
14 Subject21	15.00	59.00	50.00	51.00					
15 Subject22	16.00	42.00	43.00	40.00					
16 Subject23	16.00	52.00	50.00	50.00					
17 Subject24	16.00	40.00	0.00	2.00					
18 Subject3	10.00	59.00	5.00	9.00					
19 Subject4	15.00	47.00	22.00	2.00					



# Running Descriptives

SPSS Statistics Data Editor window showing a dataset with 19 subjects and 13 variables. A 'Frequencies' dialog box is open, highlighting the 'Statistics...' button with a red arrow.

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00				
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00				
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00				
4	Subject12	Dysthymic	Placebo					35.00				
5	Subject13	Dysthymic	Placebo					41.00				
6	Subject14	Dysthymic	Placebo					35.00				
7	Subject15	Biploar	Placebo					57.00				
8	Subject16	MDD	Placebo					55.00				
9	Subject17	Dysthymic	Placebo					39.00				
10	Subject18	MDD	Placebo					55.00				
11	Subject19	Biploar	Placebo					50.00				
12	Subject2	MDD	Drug					5.00				
13	Subject20	Dysthymic	Drug					9.00				
14	Subject21	Biploar	Drug					51.00				
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00				
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00				
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00				
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00				
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00				

The 'Frequencies' dialog box is open, showing the following variables selected:

- Subject ID [ID]
- BDI after 4 weeks of dr...
- BDI after 8 weeks of dr...
- Diagnosis Group [Dx]
- Drug or Placebo? [TxGr...
- Sex [Sex]
- Years of Education [Ed...
- BDI score Before Treat...

The 'Statistics...' button is highlighted with a red arrow.



# Running Descriptives

The screenshot shows the SPSS Statistics Data Editor interface. The main window displays a data table with columns: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, var, var, var, var, and VE. The data is organized into rows, with some rows grouped by subject ID (e.g., Subject23, Subject24, Subject3, Subject4). Two dialog boxes are open over the data table:

- Frequencies: Statistics**: This dialog box is used to select the statistics to be calculated. It has several sections:
  - Percentile Values**: Includes checkboxes for  Quartiles,  Cut points for: 10 equal groups, and  Percentile(s):.
  - Central Tendency**: Includes checkboxes for  Mean,  Median,  Mode, and  Sum.
  - Dispersion**: Includes checkboxes for  Std. deviation,  Variance,  Range,  Minimum,  Maximum, and  S.E. mean.
  - Distribution**: Includes checkboxes for  Skewness and  Kurtosis.
- Frequencies**: This dialog box is used to select the variables for which the statistics will be calculated. It includes a list of variables on the left and a list of selected variables on the right. The selected variables are: Subject ID [ID], Diagnosis Group [Dx], Drug or Placebo? [TxGr..., Sex [Sex], Years of Education [Ed..., and BDI score Before Treat... The **Display frequency tables** checkbox is also checked.

The taskbar at the bottom shows the Windows Start button, several open applications (Gmail, SPSS, Output2), and the system clock showing 10:38 AM on 10/31/2011.



# Descriptives Output

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
  - Title
  - Notes
  - Post Hoc Tests
- Frequencies
  - Title
  - Notes
  - Statistics
  - Frequency Table
    - Title
    - Diagnosis Group
    - Drug or Placebo?
    - Sex
    - Years of Education
    - BDI score Before Treat
    - BDI after 4 weeks of dr
    - BDI after 8 weeks of dr

**Frequencies**

**Statistics**

		Diagnosis Group	Drug or Placebo?	Sex	Years of Education	BDI score Before Treatment	BDI after 4 weeks of drug or placebo	BDI after 8 weeks of drug or placebo
N	Valid	24	24	24	23	24	24	24
	Missing	0	0	0	1	0	0	0
Mean		2.0000	1.5000	1.5000	15.3043	48.6667	36.8333	34.2083
Median		2.0000	1.5000	1.5000	16.0000	46.5000	40.5000	39.5000
Std. Deviation		.83406	.51075	.51075	2.60131	9.54471	16.11013	18.98507
Skewness		.000	.000	.000	-.570	-.014	-.914	-.594
Std. Error of Skewness		.472	.472	.472	.481	.472	.472	.472
Kurtosis		-1.568	-2.190	-2.190	-.637	-1.245	.101	-1.108
Std. Error of Kurtosis		.918	.918	.918	.935	.918	.918	.918
Minimum		1.00	1.00	1.00	10.00	30.00	.00	2.00
Maximum		3.00	2.00	2.00	19.00	63.00	56.00	57.00

**Frequency Table**

**Diagnosis Group**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MDD	8	33.3	33.3	33.3

SPSS Statistics Processor is ready

start Gmail - Inbox (2) - ka... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:41 AM





# Descriptives Output

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
  - Title
  - Notes
  - Post Hoc Tests
- Frequencies
  - Title
  - Notes
  - Statistics
  - Frequency Table
    - Title
    - Diagnosis Group
    - Drug or Placebo?
    - Sex
    - Years of Education
    - BDI score Before Treatment
    - BDI after 4 weeks of drug or placebo
    - BDI after 8 weeks of drug or placebo

**Drug or Placebo?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Drug	12	50.0	50.0	50.0
Placebo	12	50.0	50.0	100.0
Total	24	100.0	100.0	

**Sex**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	12	50.0	50.0	50.0
Female	12	50.0	50.0	100.0
Total	24	100.0	100.0	

**Years of Education**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 10.00	1	4.2	4.3	4.3
11.00	1	4.2	4.3	8.7
12.00	4	16.7	17.4	26.1
15.00	3	12.5	13.0	39.1
16.00	7	29.2	30.4	69.6
17.00	2	8.3	8.7	78.3
18.00	3	12.5	13.0	91.3
19.00	2	8.3	8.7	100.0

SPSS Statistics Processor is ready

start Gmail - Inbox (2) - ka... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:43 AM



# Descriptives Output

## Missing Values Accounted For

\*Output1 [Document1] - SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Frequencies
  - Title
  - Notes
  - Statistics
  - Frequency Table
    - Title
    - Diagnosis Group
    - Drug or Placebo?
    - Sex
    - Years of Education
    - BDI score Before Treatment
    - BDI after 4 weeks of drug or placebo
    - BDI after 8 weeks of drug or placebo

**Sex**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	12	50.0	50.0	50.0
Valid Female	12	50.0	50.0	100.0
Total	24	100.0	100.0	

**Years of Education**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 10.00	1	4.2	4.3	4.3
Valid 11.00	1	4.2	4.3	8.7
Valid 12.00	4	16.7	17.4	26.1
Valid 15.00	3	12.5	13.0	39.1
Valid 16.00	7	29.2	30.4	69.6
Valid 17.00	2	8.3	8.7	78.3
Valid 18.00	3	12.5	13.0	91.3
Valid 19.00	2	8.3	8.7	100.0
Total	23	95.8	100.0	
Missing 9999.00	1	4.2		
Total	24	100.0		

**BDI score Before Treatment**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 30.00	1	4.2	4.2	4.2
Valid 38.00	1	4.2	4.2	8.3
Valid 39.00	3	12.5	12.5	20.8
Valid 40.00	1	4.2	4.2	25.0
Valid 41.00	2	8.3	8.3	33.3
Valid 42.00	1	4.2	4.2	37.5
Valid 44.00	1	4.2	4.2	41.7
Valid 45.00	1	4.2	4.2	45.8

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output1 [Document... SPPS\_Lecture 10:18 AM



# Selecting Only Certain Cases

SPSS Statistics Data Editor window showing a dataset with 19 subjects. The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, Help) and a toolbar. The data table is displayed in Data View, showing columns for ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, and several unlabeled variables (var). The status bar at the bottom indicates 'SPSS Statistics Processor is ready' and the system tray shows the time as 10:19 AM.

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00					
2	Subject10	Bipolar	Drug	Female	15.00	57.00	53.00	52.00					
3	Subject11	Bipolar	Placebo	Female	16.00	39.00	41.00	40.00					
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00					
5	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00					
6	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00					
7	Subject15	Bipolar	Placebo	Male	11.00	62.00	56.00	57.00					
8	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00					
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00					
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00					
11	Subject19	Bipolar	Placebo	Female	17.00	53.00	50.00	50.00					
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00					
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00					
14	Subject21	Bipolar	Drug	Female	15.00	59.00	50.00	51.00					
15	Subject22	Bipolar	Drug	Female	16.00	42.00	43.00	40.00					
16	Subject23	Bipolar	Placebo	Male	16.00	52.00	50.00	50.00					
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00					
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00					
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00					



# Selecting Only Certain Cases

- What if I only want to include a certain population in my analyses?
  - i.e. people with **SEVERE** Depression
    - Defined as: BDI>40 at pre treatment





# Selecting Only Certain Cases

SPSS Statistics Data Editor window showing a dataset with 19 cases. The 'Data' menu is open, highlighting 'Select Cases...'. The data table includes variables: TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, and several unnamed variables (var).

Case #	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Drug	Male	12.00	63.00	30.00	8.00					
2	Drug	Female	15.00	57.00	53.00	52.00					
3	Placebo	Female	16.00	39.00	41.00	40.00					
4	Placebo	Female	19.00	38.00	36.00	35.00					
5	Placebo	Male	18.00	41.00	40.00	41.00					
6	Placebo	Female	18.00	30.00	34.00	35.00					
7	Placebo	Male	11.00	62.00	56.00	57.00					
8	Placebo	Female	16.00	60.00	50.00	55.00					
9	Placebo	Female	17.00	39.00	39.00	39.00					
10	Placebo	Male	12.00	55.00	56.00	55.00					
11	Placebo	Female	17.00	53.00	50.00	50.00					
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00			
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00			
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00			
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00			
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00			
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00			
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00			
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00			

SPSS Statistics Processor is ready

Windows taskbar: start, Gmail - Inbox - katieh..., Untitled1 [DataSet0] ..., \*Output2 [Document...], SPPS\_Lecture, 10:48 AM



# Selecting Only Certain Cases

SPSS Statistics Data Editor window showing a data table and a "Select Cases: If" dialog box.

The data table contains the following information:

ID	Dx	TxGroup	DIWk8	var	var	var	var	var
1	Subject1	MDD						
2	Subject10	Biploar						
3	Subject11	Biploar						
4	Subject12	Dysthymic						
5	Subject13	Dysthymic						
6	Subject14	Dysthymic						
7	Subject15	Biploar						
8	Subject16	MDD						
9	Subject17	Dysthymic						
10	Subject18	MDD						
11	Subject19	Biploar						
12	Subject2	MDD						
13	Subject20	Dysthymic						
14	Subject21	Biploar						
15	Subject22	Biploar						
16	Subject23	Biploar						
17	Subject24	Dysthymic						
18	Subject3	MDD	Drug	Male	15.00	47.00	22.00	9.00
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00

The "Select Cases: If" dialog box is open, showing the variable "BDIpre" selected in the expression field with the condition  $BDIpre > 40$ . The variable list on the left includes: Subject ID [ID], Diagnosis Group [Dx], Drug or Placebo? [TxGr...], Sex [Sex], Years of Education [Ed...], BDI score Before Treat..., BDI after 4 weeks of dr..., and BDI after 8 weeks of dr... The function group is set to "All".

SPSS Statistics Processor is ready

10:49 AM

# Selecting Only Certain Cases

SPSS Statistics Data Editor window showing a dataset with 19 cases. The 'filter\_\$' column indicates which cases are selected. A red box highlights rows 1 through 19, and a blue box highlights the 'filter\_\$' column.

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	filter_\$	var	var	var	
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	Selected			
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	Selected			
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	Not Selected			
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	Not Selected			
5	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	Selected			
6	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	Not Selected			
7	Subject15	Biploar	Placebo	Male	11.00	62.00	56.00	57.00	Selected			
8	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00	Selected			
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00	Not Selected			
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	Selected			
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	Selected			
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	Selected			
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00	Selected			
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	Selected			
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	Selected			
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	Selected			
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	Not Selected			
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	Selected			
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	Selected			



# Selecting All Cases

- **IMPORTANT NOTE:**

- All analyses after you select certain cases will only include those cases UNTIL you go back and select **ALL**



# Selecting All Cases

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

Visible: 8 of 8 Variables

ID	Dx	TxGroup	DIWk8	var	var	var	var
1	Subject1	MDD	Drug	8.00			
2	Subject10	Biploar	Drug	52.00			
3	Subject11	Biploar	Placebo	40.00			
4	Subject12	Dysthymic	Placebo	35.00			
5	Subject13	Dysthymic	Placebo	41.00			
6	Subject14	Dysthymic	Placebo	35.00			
7	Subject15	Biploar	Placebo	57.00			
8	Subject16	MDD	Placebo	55.00			
9	Subject17	Dysthymic	Placebo	39.00			
10	Subject18	MDD	Placebo	55.00			
11	Subject19	Biploar	Placebo	50.00			
12	Subject2	MDD	Drug	5.00			
13	Subject20	Dysthymic	Drug	9.00			
14	Subject21	Biploar	Drug	51.00			
15	Subject22	Biploar	Drug	40.00			
16	Subject23	Biploar	Placebo	50.00			
17	Subject24	Dysthymic	Drug	2.00			
18	Subject3	MDD	Drug	9.00			
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00

**Select Cases**

Select

- All cases
- If condition is satisfied  
If... BDIpre>40
- Random sample of cases  
Sample...
- Based on time or case range  
Range...
- Use filter variable:  
→

Output

- Filter out unselected cases
- Copy selected cases to a new dataset  
Dataset name: \_\_\_\_\_
- Delete unselected cases

Current Status: Do not filter cases

OK Paste Reset Cancel Help

Data View Variable View

SPSS Statistics Processor is ready Filter On

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:50 AM



# Computing New Variables

- I have BDI Scores at Pre, Week 4, and Week 8
- What if I want to have a new column that gives me the change from:
  - Pre to Week 4?
  - Pre to Week 8?



# Computing New Variables

The screenshot displays the SPSS Statistics Data Editor interface. The main window shows a data table with 19 rows and 10 columns. The columns are labeled: ID, Sex, Education, BDIpre, BDIWk4, BDIWk8, and four columns labeled 'var'. The data rows contain subject information and various numerical values. A 'Compute Variable...' menu is open over the table, listing several options for creating and transforming variables.

ID	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var
1	Subject18	Male	12.00	63.00	30.00	8.00			
2	Subject19	Female	15.00	57.00	53.00	52.00			
3	Subject2	Female	16.00	39.00	41.00	40.00			
4	Subject3	Female	19.00	38.00	36.00	35.00			
5	Subject4	Male	18.00	41.00	40.00	41.00			
6	Subject5	Female	18.00	30.00	34.00	35.00			
7	Subject6	Male	11.00	62.00	56.00	57.00			
8	Subject7	Female	16.00	60.00	50.00	55.00			
9	Subject8	Female	17.00	39.00	39.00	39.00			
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00	
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	

The 'Compute Variable...' menu is open, showing the following options:

- Compute Variable...
- Count Values within Cases...
- Shift Values...
- Recode into Same Variables...
- Recode into Different Variables...
- Automatic Recode...
- Visual Binning...
- Rank Cases...
- Date and Time Wizard...
- Create Time Series...
- Replace Missing Values...
- Random Number Generators...
- Run Pending Transforms (Ctrl-G)





# Computing New Variables

SPSS Statistics Data Editor window showing the 'Compute Variable' dialog box. The dialog box is configured to create a new variable named 'PreToWk4' with the numeric expression 'BDIWk4-BDIpre'. The background data table shows variables: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, and four empty 'var' columns. The 'Compute Variable' dialog box includes a list of variables on the left, a numeric keypad, and function groups on the right.

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var
1	Subject1				0.00	8.00					
2	Subject10				3.00	52.00					
3	Subject11				1.00	40.00					
4	Subject12				6.00	35.00					
5	Subject13				0.00	41.00					
6	Subject14				4.00	35.00					
7	Subject15				6.00	57.00					
8	Subject16				0.00	55.00					
9	Subject17				9.00	39.00					
10	Subject18				6.00	55.00					
11	Subject19				0.00	50.00					
12	Subject2				8.00	5.00					
13	Subject20				8.00	9.00					
14	Subject21				0.00	51.00					
15	Subject22				3.00	40.00					
16	Subject23				0.00	50.00					
17	Subject24				0.00	2.00					
18	Subject3				5.00	9.00					
19	Subject4				2.00	2.00					





# Computing New Variables

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1: PreToWk4 -33.0 Visible: 9 of 9 Variables

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00			
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00			
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	2.00			
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	-2.00			
5	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	-1.00			
6	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	4.00			
7	Subject15	Biploar	Placebo	Male	11.00	62.00	56.00	57.00	-6.00			
8	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00	-10.00			
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00	0.00			
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	1.00			
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	-3.00			
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	-33.00			
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00	-33.00			
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	-9.00			
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00			
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00			
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00			
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00			
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00			

Data View Variable View

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:51 AM



# Computing New Variables

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	≡ Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	9999.00	8	≡ Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	9999.00	8	≡ Right
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	9999.00	8	≡ Right
5	Education	Numeric	8	2	Years of Education	None	9999.00	8	≡ Right
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	9999.00	8	≡ Right
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	9999.00	8	≡ Right
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	9999.00	8	≡ Right
9	PreToWk4	Numeric	8	2		None	None	10	≡ Right
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									

**Don't Forget To Give Your New Variable a Label!**

Data View Variable View

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:51 AM



# Computing New Variables

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns
1	ID	String	200	0	Subject ID	None	None	8
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	9999.00	8
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	9999.00	8
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	9999.00	8
5	Education	Numeric	8	2	Years of Education	None	9999.00	8
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	9999.00	8
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	9999.00	8
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	9999.00	8
9	PreToWk4	Numeric	8	2	Change from Pre Treatment to Week 4 (Week 4 - Pre)	None	None	10
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								

Data View Variable View

SPSS Statistics Processor is ready

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# Computing New Variables

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1 : PreToWk4 -33.0 Visible: 10 of 10 Variables

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	2.00	1.00	
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	
5	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	-1.00	0.00	
6	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	4.00	5.00	
7	Subject15	Biploar	Placebo	Male	11.00	62.00	56.00	57.00	-6.00	-5.00	
8	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00	-10.00	-5.00	
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00	0.00	0.00	
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	1.00	0.00	
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	-3.00	-3.00	
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00	-33.00	-32.00	
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	-9.00	-8.00	
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00	
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00	

Data View Variable View

SPSS Statistics Processor is ready

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# T-Tests

- Paired-Samples
  - Assesses the difference between the two variables for each case
  - Tests to see if the average difference is sig different from zero.
- One Sample
  - Comparing Mean Scores to an existing pre-determined unit
- Independent-Samples
  - Comparing Mean of Two Groups (IV) on a DV



# Paired T-Tests

- Two continuous variables
  - i.e. *In the Tx group* alone, did subjects display a sig. change in BDI score from pre to Week 4?  
Week 8?
  - Is the change (difference) from Time 1 to Time 2 is sig. different from zero



# Selecting Cases

SPSS Statistics Data Editor - Untitled1 [DataSet0]

Visible: 10 of 10 Variables

ID	Dx	TxGroup	DIWk8	PreToWk4	PreToWk8	var				
1	Subject1	MDD	Drug	8.00	-33.00	-55.00				
2	Subject10	Biploar	Drug							
3	Subject11	Biploar	Placebo							
4	Subject12	Dysthymic	Placebo							
5	Subject13	Dysthymic	Placebo							
6	Subject14	Dysthymic	Placebo							
7	Subject15	Biploar	Placebo							
8	Subject16	MDD	Placebo							
9	Subject17	Dysthymic	Placebo							
10	Subject18	MDD	Placebo							
11	Subject19	Biploar	Placebo							
12	Subject2	MDD	Drug							
13	Subject20	Dysthymic	Drug							
14	Subject21	Biploar	Drug							
15	Subject22	Biploar	Drug							
16	Subject23	Biploar	Placebo							
17	Subject24	Dysthymic	Drug							
18	Subject3	MDD	Drug							
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00

**Select Cases**

Select

All cases

If condition is satisfied

[f...]

Random sample of cases

Sample...

Based on time interval

Range...

Use filter variable

Output

Filter out unselected cases

Copy selected cases to new dataset

Dataset name:

Delete unselected cases

Current Status: Do not filter cases

OK Paste Reset

**Select Cases: If**

Subject ID [ID]

Diagnosis Group [Dx]

Drug or Placebo? [TxGr...]

Sex [Sex]

Years of Education [Ed...]

BDI score Before Treat...

BDI after 4 weeks of dr...

BDI after 8 weeks of dr...

Change from Pre Treat...

Change from Pre Treat...

TxGroup=1

Function group:

All

Arithmetic

CDF & Noncentral CDF

Conversion

Current Date/Time

Date Arithmetic

Functions and Special Variables:

Continue Cancel Help



# Paired-Samples T-Test

The screenshot shows the SPSS Statistics Data Editor interface. The 'Analyze' menu is open, and the path 'Analyze > Compare Means > Paired-Samples T Test...' is highlighted. The data table below shows variables for each subject, including ID, gender, medication, and BDI scores at different time points.

ID	Medication	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt				
1	Subject1										
2	Subject10										
3	Subject11										
4	Subject12	cebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not	
5	Subject13	cebo	Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not	
6	Subject14	cebo	Female	18.00	30.00	34.00	35.00	4.00	5.00	Not	
7	Subject15	cebo	Male	11.00	62.00	56.00	57.00	-6.00	-5.00	Not	
8	Subject16	cebo	Female	16.00	60.00	50.00	55.00	-10.00	-5.00	Not	
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00	0.00	0.00	Not
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	1.00	0.00	Not
11	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	-3.00	-3.00	Not
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00	-33.00	-32.00	
14	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	-9.00	-8.00	
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00	
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00	



# Paired-Samples T-Test

Untitled1 [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1.: PreToWk4 -33.0 Visible: 11 of 11 Variables

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt	
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00		
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00		
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	2.00	1.00	Not	
4	Subject12	Dysthymic	Placebo						0.00	-2.00	-3.00	Not
5	Subject13	Dysthymic	Placebo						0.00	-1.00	0.00	Not
6	Subject14	Dysthymic	Placebo						0.00	4.00	5.00	Not
7	Subject15	Biploar	Placebo						0.00	-6.00	-5.00	Not
8	Subject16	MDD	Placebo						0.00	-10.00	-5.00	Not
9	Subject17	Dysthymic	Placebo						0.00	0.00	0.00	Not
10	Subject18	MDD	Placebo						0.00	1.00	0.00	Not
11	Subject19	Biploar	Placebo						0.00	-3.00	-3.00	Not
12	Subject2	MDD							0.00	-33.00	-56.00	
13	Subject20	Dysthymic							0.00	-33.00	-32.00	
14	Subject21	Biploar							0.00	-9.00	-8.00	
15	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00		
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not	
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00		
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00		
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00		

**Paired-Samples T Test**

Paired Variables:

Pair	Variable1	Variable2
1	BDI scor...	BDI after...
2	BDI scor...	BDI after...
3		

Options...

OK Paste Reset Cancel Help

Data View Variable View

SPSS Statistics Processor is ready Filter On

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# Paired-Samples T-Test

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- T-Test
- Title
- Notes
- Paired Samples Statistics
- Paired Samples Test

**T-Test - Paired T Test Examining Changes From Pre to Post for Drug Group Only**

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BDI score Before Treatment	50.3333	12	8.68995	2.50857
	BDI after 4 weeks of drug or placebo	28.0000	12	17.62230	5.08712
Pair 2	BDI score Before Treatment	50.3333	12	8.68995	2.50857
	BDI after 8 weeks of drug or placebo	22.6667	12	19.69002	5.68402

**Paired Samples Test**

		Paired Differences					t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference							
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	BDI score Before Treatment - BDI after 4 weeks of drug or placebo	22.33333	17.30125	4.99444	11.34064	33.32602	4.472	11	.001
Pair 2	BDI score Before Treatment - BDI after 8 weeks of drug or placebo	27.66667	21.24033	6.13155	14.17121	41.16213	4.512	11	.001

SPSS Statistics Processor is ready

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# One-Sample T-Test

- Question:
  - Does our sample as a whole at pre have BDI scores significantly different from what clinicians deem to be the cutoff for *severe* depression (BDI=30)?



# One-Sample T-Test

SPSS Statistics Data Editor window showing a dataset with 19 subjects. The 'Analyze' menu is open, and the 'One-Sample T Test...' option is selected. The data table includes variables: ID, Education, BDIpre, BDIWk4, BDIWk8, PreToWk4, PreToWk8, and filt.

ID	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt				
1	Subject1	12.00	63.00	30.00	8.00	-33.00	-55.00				
2	Subject16	16.00	60.00	50.00	55.00	-10.00	-5.00	Not			
3	Subject18	12.00	55.00	56.00	55.00	1.00	0.00	Not			
4	Subject2	Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00		
5	Subject3	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00		
6	Subject4	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00		
7	Subject6	cebo	Female	9999.00	56.00	54.00	55.00	-2.00	-1.00	Not	
8	Subject9	cebo	Male	16.00	39.00	42.00	37.00	3.00	-2.00	Not	
9	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
10	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	2.00	1.00	Not
11	Subject15	Biploar	Placebo	Male	11.00	62.00	56.00	57.00	-6.00	-5.00	Not
12	Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	-3.00	-3.00	Not
13	Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	-9.00	-8.00	
14	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
15	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
16	Subject7	Biploar	Drug	Female	12.00	45.00	45.00	45.00	0.00	0.00	
17	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not
18	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not
19	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	4.00	5.00	Not





# One-Sample T-Test

SPSS Statistics Data Editor window showing a dataset with 19 subjects and 11 variables. A dialog box for a One-Sample T-Test is open, with 'BDI score Before Treat...' selected as the test variable and a test value of 30. A red arrow points to the test value field.

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt	
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00	-10.00	-5.00	Not
3	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	1.00	0.00	Not
4	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
5	Subject3	MDD	Drug					9.00	-54.00	-50.00	
6	Subject4	MDD	Drug					2.00	-25.00	-45.00	
7	Subject6	MDD	Placebo					55.00	-2.00	-1.00	Not
8	Subject9	MDD	Placebo					37.00	3.00	-2.00	Not
9	Subject10	Biploar	Drug					52.00	-4.00	-5.00	
10	Subject11	Biploar	Placebo					40.00	2.00	1.00	Not
11	Subject15	Biploar	Placebo					57.00	-6.00	-5.00	Not
12	Subject19	Biploar	Placebo					50.00	-3.00	-3.00	Not
13	Subject21	Biploar	Drug					51.00	-9.00	-8.00	
14	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
15	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
16	Subject7	Biploar	Drug	Female	12.00	45.00	45.00	45.00	0.00	0.00	
17	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not
18	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not
19	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	4.00	5.00	Not



# One-Sample T-Test

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- Correlations
- T-Test
- T-Test
- Title
- Notes
- Active Dataset
- One-Sample Statistics
- One-Sample Test

### T-Test

[DataSet0]

#### One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
BDI score Before Treatment	24	48.6667	9.54471	1.94831

#### One-Sample Test

Test Value = 30

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
BDI score Before Treatment	9.581	23	.000	18.6667	14.6363	22.6970

SPSS Statistics Processor is ready

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# Independent Samples T-Test

- Do two groups differ on a continuous measure?
  - IV = Categorical (Only 2 Groups)
  - DV = Continuous
- i.e. Does our sample differ in any important measure pre-treatment on the basis of sex?
  - i.e. BDI Scores Pre-Treatment
    - IV = Sex
    - DV = Pre BDI Score



# Independent-Sample T-Test

The screenshot shows the SPSS Statistics Data Editor interface. The 'Analyze' menu is open, and the path 'Analyze > Compare Means > Independent-Samples T Test...' is highlighted. The data table below shows 19 subjects with various demographic and clinical variables.

ID	Subject	Diagnosis	Treatment	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1												
2	Subject10												
3	Subject11												
4	Subject12		cebo	Female	19.00	38.00	36.00	35.00					
5	Subject13		cebo	Male	18.00	41.00	40.00	41.00					
6	Subject14		cebo	Female	18.00	30.00	34.00	35.00					
7	Subject15		cebo	Male	11.00	62.00	56.00	57.00					
8	Subject16		cebo	Female	16.00	60.00	50.00	55.00					
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00					
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00					
11	Subject19	Bipolar	Placebo	Female	17.00	53.00	50.00	50.00					
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00					
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00					
14	Subject21	Bipolar	Drug	Female	15.00	59.00	50.00	51.00					
15	Subject22	Bipolar	Drug	Female	16.00	42.00	43.00	40.00					
16	Subject23	Bipolar	Placebo	Male	16.00	52.00	50.00	50.00					
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00					
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00					
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00					



# Independent-Sample T-Test

SPSS Statistics Data Editor window showing a dataset with 19 subjects and 13 variables. Two dialog boxes are open: 'Define Groups' and 'Independent-Samples T Test'.

**Define Groups Dialog:**

- Use specified values (selected)
- Group 1: 1
- Group 2: 2
- Out point: (empty)
- Buttons: Continue, Cancel, Help

**Independent-Samples T Test Dialog:**

- Test Variable(s): Years of Education [Ed...], BDI score Before Treat...
- Grouping Variable: Sex(1 2)
- Buttons: OK, Paste, Reset, Cancel, Help

**Dataset Data:**

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00				
2	Subject10	Bipolar	Drug	Female	15.00	57.00	53.00	52.00				
3	Subject11	Bipolar	Placebo	Female	16.00	39.00	41.00	40.00				
4	Subject12			Female	18.00	39.00	36.00	35.00				
5	Subject13							41.00				
6	Subject14							35.00				
7	Subject15							57.00				
8	Subject16							55.00				
9	Subject17							39.00				
10	Subject18							55.00				
11	Subject19	Bipolar	Placebo					50.00				
12	Subject2	MDD	Drug					5.00				
13	Subject20	Dysthymic	Drug					9.00				
14	Subject21	Bipolar	Drug	Female	15.00	59.00	50.00	51.00				
15	Subject22	Bipolar	Drug	Female	16.00	42.00	43.00	40.00				
16	Subject23	Bipolar	Placebo	Male	16.00	52.00	50.00	50.00				
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00				
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00				
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00				

# Independent-Sample T-Test

**T-Test**  
[DataSet0]

**Group Statistics**

	Sex	N	Mean	Std. Deviation	Std. Error Mean
Years of Education	Male	12	14.5833	3.05877	.88299
	Female	11	16.0909	1.81409	.54697
BDI score Before Treatment	Male	12	50.3333	9.39374	2.71174
	Female	12	47.0000	9.80723	2.83110

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
				95% Confidence Interval of the Difference						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Years of Education	Equal variances assumed	7.128	.014	-1.420	21	.170	-1.50758	1.06159	-3.71528	.70013
	Equal variances not assumed			-1.451	18.126	.164	-1.50758	1.03867	-3.68867	.67351
BDI score Before Treatment	Equal variances assumed	.000	1.000	.850	22	.404	3.33333	3.92029	-4.79685	11.46352
	Equal variances not assumed			.850	21.959	.404	3.33333	3.92029	-4.79773	11.46439

SPSS Statistics Processor is ready

start | Gmail - Inbox - katieh... | Untitled1 [DataSet0] ... | \*Output2 [Document2] - SPSS Statistics Viewer | SPPS\_Lecture | 10:45 AM



# Independent Samples T-Test

- Is there a significant difference in the BDI *change score* from Pre to Week 4 between those who received the drug and those who were in the placebo group?
  - IV = Treatment Group (drug vs placebo)
  - DV = BDI Change Score



# Independent-Sample T-Test

The screenshot displays the SPSS Statistics Data Editor interface. The main window shows a dataset with 19 rows and 12 columns. The columns are: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, PreToWk4, PreToWk8, and var. The data is as follows:

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	var
1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
3	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	2.00	1.00	
4	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	-2.00	-3.00	
5	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	-1.00	0.00	
6	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	4.00	5.00	
7	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	-6.00	-5.00	
8	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	-10.00	-5.00	
9	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	0.00	0.00	
10	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	55.00	1.00	0.00
11	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	50.00	-3.00	-3.00
12	Dysthymic	Placebo	Female	18.00	38.00	36.00	35.00	5.00	-33.00	-56.00
13	Dysthymic	Drug	Female	15.00	59.00	50.00	51.00	-9.00	-8.00	
14	Biploar	Drug	Female	15.00	59.00	50.00	51.00	1.00	-2.00	
15	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
16	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	
17	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00	
18	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
19	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00	

Two dialog boxes are overlaid on the data view:

- Define Groups:** The "Use specified values" radio button is selected. Group 1 is set to 1, and Group 2 is set to 2.
- Independent-Samples T Test:** The "Test Variable(s)" list contains "Change from Pre Treat...". The "Grouping Variable" is set to "TxGroup(? ?)".

The Windows taskbar at the bottom shows the Start button, several open applications (Gmail, SPSS, Output2, SPPS\_Lecture), and the system clock showing 10:53 AM on 10/5/2012.

# Independent-Sample T-Test

**T-Test - Examining whether the change from pre to post was significantly different b/w the Drug and Placebo Group (Independent of Diagnostic Group)**

**Group Statistics**

	Drug or Placebo?	N	Mean	Std. Deviation	Std. Error Mean
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Drug	12	-22.3333	17.30125	4.99444
	Placebo	12	-1.3333	3.89249	1.12367
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Drug	12	-27.6667	21.24033	6.13155
	Placebo	12	-1.2500	2.76751	.79891

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Equal variances assumed	18.859	.000	-4.102	22	.000	-21.00000	5.11928	-31.61675	-10.38325
	Equal variances not assumed			-4.102	12.111	.001	-21.00000	5.11928	-32.14266	-9.85734
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Equal variances assumed	36.252	.000	-4.272	22	.000	-26.41667	6.18338	-39.24022	-13.59312
	Equal variances not assumed			-4.272	11.373	.001	-26.41667	6.18338	-39.97189	-12.86145

SPSS Statistics Processor is ready

start | Gmail - Inbox - katieh... | Untitled1 [DataSet0] ... | \*Output2 [Document2] - SPSS Statistics Viewer | SPPS\_Lecture | 10:56 AM





# Levene's Test: homogeneity of variance

**T-Test - Examining whether the change from pre to post was significantly different b/w the Drug and Placebo Group (Independent of Diagnostic Group)**

**Group Statistics**

	Drug or Placebo?	N	Mean	Std. Deviation	Std. Error Mean
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Drug	12	-22.3333	17.30125	4.99444
	Placebo	12	-1.3333	3.89249	1.12367
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Drug	12	-27.6667	21.24033	6.13155
	Placebo	12	-1.2500	2.76751	.79891

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Equal variances assumed	18.859	.000	-4.102	22	.000	-21.00000	5.11928	-31.61875	-10.38325
	Equal variances not assumed			-4.102	12.111	.001	-21.00000	5.11928	-32.14266	-9.85734
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Equal variances assumed	36.252	.000	-4.272	22	.000	-26.41667	6.18338	-39.24022	-13.59312
	Equal variances not assumed			-4.272	11.373	.001	-26.41667	6.18338	-39.97189	-12.86145

# Levene's Test: homogeneity of variance

**T-Test - Examining whether the change from pre to post was significantly different b/w the Drug and Placebo Group (Independent of Diagnostic Group)**

**Group Statistics**

	Drug or Placebo?	N	Mean	Std. Deviation	Std. Error Mean
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Drug	12	-22.3333	17.30125	4.99444
	Placebo	12	-1.3333	3.89249	1.12367
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Drug	12	-27.6667	21.24033	6.13155
	Placebo	12	-1.2500	2.76751	.79891

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Equal variances assumed	18.859	.000	-4.102	22	.000	-21.00000	5.11928	-31.61875	-10.38325
	Equal variances not assumed			-4.102	12.111	.001	-21.00000	5.11928	-32.14266	-9.85734
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Equal variances assumed	36.252	.000	-4.272	22	.000	-26.41667	6.18338	-39.24022	-13.59312
	Equal variances not assumed			-4.272	11.373	.001	-26.41667	6.18338	-39.97189	-12.86145



# One-Way ANOVA

- IV = Categorical
- DV = Continuous
- Two or more groups
  - Note: An Ind-T-Test can only have 2 groups
- i.e. Did the three Diagnostic Groups Differ in Pre-Treatment BDI Scores?



# One-Way ANOVA

SPSS Statistics Data Editor window showing a dataset with 19 subjects and 8 variables. The 'Analyze' menu is open, highlighting 'One-Way ANOVA...'.

ID				education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1			12.00	63.00	30.00	8.00					
2	Subject10			15.00	57.00	53.00	52.00					
3	Subject11			16.00	39.00	41.00	40.00					
4	Subject12	cebo	Female	19.00	38.00	36.00	35.00					
5	Subject13	cebo	Male	18.00	41.00	40.00	41.00					
6	Subject14	cebo	Female	18.00	30.00	34.00	35.00					
7	Subject15	cebo	Male	11.00	62.00	56.00	57.00					
8	Subject16	cebo	Female	16.00	60.00	50.00	55.00					
9	Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00				
10	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00				
11	Subject19	Bipolar	Placebo	Female	17.00	53.00	50.00	50.00				
12	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00				
13	Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00				
14	Subject21	Bipolar	Drug	Female	15.00	59.00	50.00	51.00				
15	Subject22	Bipolar	Drug	Female	16.00	42.00	43.00	40.00				
16	Subject23	Bipolar	Placebo	Male	16.00	52.00	50.00	50.00				
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00				
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00				
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00				

SPSS Statistics Processor is ready

Windows taskbar: start, Gmail - Inbox - katieh..., Untitled1 [DataSet0] ..., SPSS\_Lecture, 10:24 AM



# One-Way ANOVA

SPSS Statistics Data Editor window showing a dataset and a One-Way ANOVA dialog box.

**Dataset Data:**

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var	
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00					
2	Subject10	Bipolar	Drug	Female	15.00	57.00	53.00	52.00					
3	Subject11	Bipolar	Placebo	Female	16.00	39.00	41.00	40.00					
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00					
5	Subject13	Dysthymic	Placebo					41.00					
6	Subject14	Dysthymic	Placebo					35.00					
7	Subject15	Bipolar	Placebo					57.00					
8	Subject16	MDD	Placebo					55.00					
9	Subject17	Dysthymic	Placebo					39.00					
10	Subject18	MDD	Placebo					55.00					
11	Subject19	Bipolar	Placebo					50.00					
12	Subject2	MDD	Drug					5.00					
13	Subject20	Dysthymic	Drug					9.00					
14	Subject21	Bipolar	Drug	Female	15.00	59.00	50.00	51.00					
15	Subject22	Bipolar	Drug	Female	16.00	42.00	43.00	40.00					
16	Subject23	Bipolar	Placebo	Male	16.00	52.00	50.00	50.00					
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00					
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00					
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00					

**One-Way ANOVA Dialog Box:**

- Dependent List: BDI score Before Treat...
- Factor: Diagnosis Group [Dx]
- Buttons: Contrasts..., Post Hoc..., Options..., OK, Paste, Reset, Cancel, Help

SPSS Statistics Processor is ready. System tray shows: start, Gmail - Inbox - katieh..., Untitled1 [DataSet0] ..., SPSS\_Lecture, 10:25 AM.





# One-Way ANOVA

SPSS Statistics Data Editor window showing a dataset and two dialog boxes for a One-Way ANOVA analysis.

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00				
2	Subject10	Bipolar	Drug	Female	15.00	57.00	53.00	52.00				
3	Subject11	Bipolar	Placebo	Female	16.00	39.00	41.00	40.00				
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00				
5	Subject13	Dysthymic	Placebo					41.00				
6	Subject14	Dysthymic	Placebo					35.00				
7	Subject15	Bipolar	Placebo					57.00				
8	Subject16	MDD	Placebo					55.00				
9	Subject17	Dysthymic	Placebo									
10	Subject18	MDD	Placebo									
11	Subject19	Bipolar	Placebo									
12	Subject2	MDD	Drug									
13	Subject20	Dysthymic	Drug									
14	Subject21	Bipolar	Drug	Female	15.00	5						
15	Subject22	Bipolar	Drug	Female	16.00	4						
16	Subject23	Bipolar	Placebo	Male	16.00	5						
17	Subject24	Dysthymic	Drug	Male	16.00	4						
18	Subject3	MDD	Drug	Male	10.00	5						
19	Subject4	MDD	Drug	Male	15.00	4						

**One-Way ANOVA Dialog Box:**  
Dependent List: BDI score Before Treat...  
Factor: Drug or Placebo? [TxGr...  
Options: Contrasts..., Post Hoc..., Options...

**One-Way ANOVA: Post Hoc Multiple Comparisons Dialog Box:**  
Equal Variances Assumed:  
 LSD  S-N-K  Waller-Duncan  
 Bonferroni  Tukey  
 Sidak  Tukey's-b  
 Scheffe  Duncan  
 R-E-G-WF  Hochberg's GT2  
 R-E-G-WQ  Gabriel  
Test:  2-sided  < Control  > Control  
Control Category: Last  
Type I/Type II Error Ratio: 100  
Equal Variances Not Assumed:  
 Tamhane's T2  Dunnett's T3  Games-Howell  Dunnett's C  
Significance level: 0.05



# One-Way ANOVA

SPSS Statistics Data Editor window showing a dataset and two dialog boxes for One-Way ANOVA.

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00				
2	Subject10	Bipolar	Drug	Female	15.00	57.00	53.00	52.00				
3	Subject11	Bipolar	Placebo	Female	16.00	39.00	41.00	40.00				
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00				
5	Subject13	Dysthymic	Placebo					41.00				
6	Subject14	Dysthymic	Placebo					35.00				
7	Subject15	Bipolar	Placebo					57.00				
8	Subject16	MDD	Placebo					55.00				
9	Subject17	Dysthymic	Placebo					39.00				
10	Subject18	MDD	Placebo					55.00				
11	Subject19	Bipolar	Placebo					50.00				
12	Subject2	MDD	Drug					5.00				
13	Subject20	Dysthymic	Drug					9.00				
14	Subject21	Bipolar	Drug	Female	15.00	59.00	50.00	51.00				
15	Subject22	Bipolar	Drug	Female	16.00	42.00	43.00	40.00				
16	Subject23	Bipolar	Placebo	Male	16.00	52.00	50.00	50.00				
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00				
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00				
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00				

**One-Way ANOVA** dialog box:

- Dependent List: BDI score Before Treat...
- Factor: Diagnosis Group [Dx]
- Buttons: Contrasts..., Post Hoc..., Options..., OK, Paste, Reset, Cancel, Help

**One-Way ANOVA: Options** dialog box:

- Statistics:  Descriptive,  Fixed and random effects,  Homogeneity of variance test,  Brown-Forsythe,  Welch,  Means plot
- Missing Values:  Exclude cases analysis by analysis,  Exclude cases listwise
- Buttons: Continue, Cancel, Help





# One-Way ANOVA

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output  
  Oneway  
    Title  
    Notes  
    Descriptives  
    ANOVA  
    Post Hoc Tests

### Oneway Descriptives

BDI score Before Treatment

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
MDD	8	55.0000	8.12404	2.87228	48.2081	61.7919	39.00	63.00
Bipolar	8	51.1250	8.33988	2.94859	44.1527	58.0973	39.00	62.00
Dysthymic	8	39.8750	4.76408	1.68436	35.8921	43.8579	30.00	46.00
Total	24	48.6667	9.54471	1.94831	44.6363	52.6970	30.00	63.00

### ANOVA

BDI score Before Treatment

	Statistics				
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	987.583	2	493.792	9.361	.001
Within Groups	1.108E3	21	52.750		
Total	2.095E3	23			

$$F = \frac{(\text{between-group variability})}{(\text{within-group variability})}$$

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:30 AM



# Post Hoc Tests

\*Output2 [Document2] - SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
  - Title
  - Notes
  - Post Hoc Tests
    - Title
    - Multiple Comparisons

**Oneway**

**Post Hoc Tests**

**Multiple Comparisons**

BDI score Before Treatment  
Bonferroni

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Diagnosis Group	(J) Diagnosis Group				Lower Bound	Upper Bound
MDD	Bipolar	3.87500	3.63146	.894	-5.5717	13.3217
	Dysthymic	15.12500*	3.63146	.001	5.6783	24.5717
Bipolar	MDD	-3.87500	3.63146	.894	-13.3217	5.5717
	Dysthymic	11.25000*	3.63146	.016	1.8033	20.6967
Dysthymic	MDD	-15.12500*	3.63146	.001	-24.5717	-5.6783
	Bipolar	-11.25000*	3.63146	.016	-20.6967	-1.8033

\*. The mean difference is significant at the 0.05 level.

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Untitled1 [DataSet0] ... \*Output2 [Document... SPPS\_Lecture 10:31 AM



# One-Way ANOVA

SPSS \_Lecture\_File.sav [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1.: PreToWk4 -33.0 Visible: 11 of 11 Variables

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject16	MDD	Placebo	Female	16.00	60.00	50.00	55.00	-10.00	-5.00	Not
3	Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	1.00	0.00	Not
4	Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
5	Subject3	MDD	Drug					9.00	-54.00	-50.00	
6	Subject4	MDD	Drug					2.00	-25.00	-45.00	
7	Subject6	MDD	Placebo					55.00	-2.00	-1.00	Not
8	Subject9	MDD	Placebo					37.00	3.00	-2.00	Not
9	Subject10	Biploar	Drug					52.00	-4.00	-5.00	
10	Subject11	Biploar	Placebo					40.00	2.00	1.00	Not
11	Subject15	Biploar	Placebo					57.00	-6.00	-5.00	Not
12	Subject19	Biploar	Placebo					50.00	-3.00	-3.00	Not
13	Subject21	Biploar	Drug					51.00	-9.00	-8.00	
14	Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
15	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
16	Subject7	Biploar	Drug	Female	12.00	45.00	45.00	45.00	0.00	0.00	
17	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not
18	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not
19	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	4.00	5.00	Not

**One-Way ANOVA**

Dependent List:  
Change from Pre Treat...  
Change from Pre Treat...

Factor:  
Diagnosis Group [Dx]

Contrasts...  
Post Hoc...  
Options...

OK Paste Reset Cancel Help

Data View Variable View

SPSS Statistics Processor is ready

start Gmail - Inbox - katieh... Mail :: Inbox - Mozilla ... Correlation - Wikipedi... SPSS\_Lecture\_File.sa... SPPS\_Lecture Gmail - Inbox (415) - ... 2:14 PM



# One-Way ANOVA

**\*Output3 [Document3] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
  - Title
  - Notes
  - Descriptives
  - ANOVA
  - Post Hoc Tests

**Oneway**

**Descriptives**

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Change from Pre Treatment to Week 4 (Week 4 - Pre)	MDD	8	-19.1250	20.37812	7.20475	-36.1615	-2.0885	-54.00	3.00
	Biploar	8	-2.6250	3.70087	1.30845	-5.7190	.4690	-9.00	2.00
	Dysthymic	8	-13.7500	16.77370	5.93040	-27.7732	.2732	-40.00	4.00
	Total	24	-11.8333	16.29261	3.32572	-18.7131	-4.9536	-54.00	4.00
Change from Pre Treatment to Week 8 (Week 8 - Pre)	MDD	8	-26.7500	26.70340	9.44108	-49.0746	-4.4254	-56.00	.00
	Biploar	8	-3.0000	2.92770	1.03510	-5.4476	-.5524	-8.00	1.00
	Dysthymic	8	-13.6250	16.55241	5.85216	-27.4632	.2132	-38.00	5.00
	Total	24	-14.4583	20.03688	4.09001	-22.9192	-5.9975	-56.00	5.00

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Between Groups	1133.083	2	566.542	2.393	.116
	Within Groups	4972.250	21	236.774		
	Total	6105.333	23			
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Between Groups	2264.583	2	1132.292	3.412	.052
	Within Groups	6969.375	21	331.875		
	Total	9233.958	23			

**NOTE: Don't Run Post-Hoc If  $p=ns$**

SPSS Statistics Processor is ready

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# Comparing Groups

- So we know that the change from Pre to Week 8 was not sig. different between the groups
- BUT, was each group's change statistically significant?



# Comparing Groups

The screenshot displays the SPSS Statistics Data Editor interface. The main window shows a data table with 19 rows and 12 columns. The columns are: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, PreToWk4, PreToWk8, and filt. The data table is as follows:

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
3	Subject11	Biploar	Placebo					40.00	2.00	1.00	Not
4	Subject12	Dysthymic	Placebo					35.00	-2.00	-3.00	Not
5	Subject13	Dysthymic	Placebo					41.00	-1.00	0.00	Not
6	Subject14	Dysthymic	Placebo					35.00	4.00	5.00	Not
7	Subject15	Biploar	Placebo					57.00	-6.00	-5.00	Not
8	Subject16	MDD	Placebo					55.00	-10.00	-5.00	Not
9	Subject17	Dysthymic	Placebo					39.00	0.00	0.00	Not
10	Subject18	MDD	Placebo					55.00	1.00	0.00	Not
11	Subject19	Biploar	Placebo					50.00	-3.00	-3.00	Not
12	Subject2	MDD	Drug					5.00	-33.00	-56.00	
13	Subject20	Dysthymic	Drug					9.00	-33.00	-32.00	
14	Subject21	Biploar	Drug					51.00	-9.00	-8.00	
15	Subject22	Biploar	Drug					40.00	1.00	-2.00	
16	Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00	
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00	

The 'Split File' dialog box is open, showing the following options:

- Analyze all cases, do not create groups
- Compare groups
- Organize output by groups

Groups Based on:  Diagnosis Group [Dx]

Sort the file by grouping variables

File is already sorted

Current Status: Analysis by groups is off.

Buttons: OK, Paste, Reset, Cancel, Help



# Comparing Groups

SPSS Statistics Data Editor window showing a dataset with 19 subjects and 11 variables. The 'Analyze' menu is open, highlighting the 'Compare Means' option, which includes 'Paired-Samples T Test...'. The data table below shows the values for each variable across the subjects.

ID	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt	
1 Subject1	12.00	63.00	30.00	8.00	-33.00	-55.00		
2 Subject16	16.00	60.00	50.00	55.00	-10.00	-5.00	Not	
3 Subject18	12.00	55.00	56.00	55.00	1.00	0.00	Not	
4 Subject2	Drug Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
5 Subject3	Drug Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
6 Subject4	Drug Male	15.00	47.00	22.00	2.00	-25.00	-45.00	
7 Subject6	cebo Female	9999.00	56.00	54.00	55.00	-2.00	-1.00	Not
8 Subject9	cebo Male	16.00	39.00	42.00	37.00	3.00	-2.00	Not
9 Subject10	Biploar Drug Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
10 Subject11	Biploar Placebo Female	16.00	39.00	41.00	40.00	2.00	1.00	Not
11 Subject15	Biploar Placebo Male	11.00	62.00	56.00	57.00	-6.00	-5.00	Not
12 Subject19	Biploar Placebo Female	17.00	53.00	50.00	50.00	-3.00	-3.00	Not
13 Subject21	Biploar Drug Female	15.00	59.00	50.00	51.00	-9.00	-8.00	
14 Subject22	Biploar Drug Female	16.00	42.00	43.00	40.00	1.00	-2.00	
15 Subject23	Biploar Placebo Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
16 Subject7	Biploar Drug Female	12.00	45.00	45.00	45.00	0.00	0.00	
17 Subject12	Dysthymic Placebo Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not
18 Subject13	Dysthymic Placebo Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not
19 Subject14	Dysthymic Placebo Female	18.00	30.00	34.00	35.00	4.00	5.00	Not





# Comparing Groups

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- T-Test
- Correlations
- Notes
- Correlations
- Log
- T-Test
  - Title
  - Notes
  - Diagnosis Group = MDD
    - Title
    - Paired Samples Statistics
    - Paired Samples Test
  - Diagnosis Group = Bipolar
    - Title
    - Paired Samples Statistics
    - Paired Samples Correlations
    - Paired Samples Test
  - Diagnosis Group = Dysthymic
    - Title
    - Paired Samples Statistics
    - Paired Samples Correlations
    - Paired Samples Test

**Diagnosis Group = MDD**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BDI score Before Treatment	55.0000	8	8.12404	2.87228
	BDI after 4 weeks of drug or placebo	35.8750	8	17.77990	6.28615
Pair 2	BDI score Before Treatment	55.0000	8	8.12404	2.87228
	BDI after 8 weeks of drug or placebo	28.2500	8	24.59239	8.69472

a. Diagnosis Group = MDD

**Paired Samples Test<sup>a</sup>**

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	BDI score Before Treatment - BDI after 4 weeks of drug or placebo	19.12500	20.37812	7.20475	2.08846	36.16154	2.654	7	.033
Pair 2	BDI score Before Treatment - BDI after 8 weeks of drug or placebo	26.75000	26.70340	9.44108	4.42540	49.07460	2.833	7	.025

a. Diagnosis Group = MDD

SPSS Statistics Processor is ready

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# Comparing Groups

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- T-Test
- Correlations
  - Title
  - Notes
  - Correlations
- Log
- T-Test
  - Title
  - Notes
  - Diagnosis Group = MDD
    - Title
    - Paired Samples Statistics
    - Paired Samples Test
  - Diagnosis Group = Bipolar
    - Title
    - Paired Samples Statistics
    - Paired Samples Test
  - Diagnosis Group = Dysthymic
    - Title
    - Paired Samples Statistics
    - Paired Samples Correlations
    - Paired Samples Test

**Diagnosis Group = Bipolar**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BDI score Before Treatment	51.1250	8	8.33988	2.94859
	BDI after 4 weeks of drug or placebo	48.5000	8	5.09902	1.80278
Pair 2	BDI score Before Treatment	51.1250	8	8.33988	2.94859
	BDI after 8 weeks of drug or placebo	48.1250	8	5.98659	2.11658

a. Diagnosis Group = Bipolar

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	BDI score Before Treatment - BDI after 4 weeks of drug or placebo	2.62500	3.70087	1.30845	-.46900	5.71900	2.006	7	.085
Pair 2	BDI score Before Treatment - BDI after 8 weeks of drug or placebo	3.00000	2.92770	1.03510	.55238	5.44762	2.898	7	.023

a. Diagnosis Group = Bipolar

SPSS Statistics Processor is ready

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# Comparing Groups

**\*Output2 [Document2] - SPSS Statistics Viewer**

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- T-Test
- Correlations
- Correlations
- Log
- T-Test
  - Diagnosis Group = MDD
    - Paired Samples Statistics
    - Paired Samples Test
  - Diagnosis Group = Bipolar
    - Paired Samples Statistics
    - Paired Samples Test
  - Diagnosis Group = Dysthymic
    - Paired Samples Statistics
    - Paired Samples Test

**Diagnosis Group = Dysthymic**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BDI score Before Treatment	39.8750	8	4.76408	1.68436
	BDI after 4 weeks of drug or placebo	26.1250	8	14.93259	5.27947
Pair 2	BDI score Before Treatment	39.8750	8	4.76408	1.68436
	BDI after 8 weeks of drug or placebo	26.2500	8	14.46918	5.11563

a. Diagnosis Group = Dysthymic

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	BDI score Before Treatment - BDI after 4 weeks of drug or placebo	13.75000	16.77370	5.93040	-.27317	27.77317	2.319	7	.054
Pair 2	BDI score Before Treatment - BDI after 8 weeks of drug or placebo	13.62500	16.55241	5.85216	-.21316	27.46316	2.328	7	.053

SPSS Statistics Processor is ready | H: 157, W: 429 pt.

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# Correlations

- Strength and direction of a *linear* relationship between two continuous variables
- Pearson product-moment correlation
  - dividing the covariance of the two variables by the product of their SD



# Correlations

SPSS Statistics Data Editor window showing a dataset with 19 subjects and 11 variables. The 'Analyze' menu is open, highlighting the 'Correlate' option. The data table includes columns for ID, Sex, Education, BDIpre, BDIWk4, BDIWk8, PreToWk4, PreToWk8, and a filter variable.

ID	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt		
1 Subject1	Male	12.00	63.00	30.00	8.00	-33.00	-55.00			
2 Subject10	male	15.00	57.00	53.00	52.00	-4.00	-5.00			
3 Subject11	male	16.00	39.00	41.00	40.00	2.00	1.00	Not		
4 Subject12	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not		
5 Subject13	Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not		
6 Subject14	Female	18.00	30.00	34.00	35.00	4.00	5.00	Not		
7 Subject15	Male	11.00	62.00	56.00	57.00	-6.00	-5.00	Not		
8 Subject16	Female	16.00	60.00	50.00	55.00	-10.00	-5.00	Not		
9 Subject17	Dysthymic	Placebo	Female	17.00	39.00	39.00	39.00	0.00	0.00	Not
10 Subject18	MDD	Placebo	Male	12.00	55.00	56.00	55.00	1.00	0.00	Not
11 Subject19	Biploar	Placebo	Female	17.00	53.00	50.00	50.00	-3.00	-3.00	Not
12 Subject2	MDD	Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
13 Subject20	Dysthymic	Drug	Male	18.00	41.00	8.00	9.00	-33.00	-32.00	
14 Subject21	Biploar	Drug	Female	15.00	59.00	50.00	51.00	-9.00	-8.00	
15 Subject22	Biploar	Drug	Female	16.00	42.00	43.00	40.00	1.00	-2.00	
16 Subject23	Biploar	Placebo	Male	16.00	52.00	50.00	50.00	-2.00	-2.00	Not
17 Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00	
18 Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
19 Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00	





# Correlations

SPSS Statistics Data Editor window showing a dataset with 19 subjects and a 'Bivariate Correlations' dialog box open.

The dataset includes variables: ID, Dx, TxGroup, Sex, Education, BDIpre, BDIWk4, BDIWk8, PreToWk4, PreToWk8, and filter.

The 'Bivariate Correlations' dialog box shows the following configuration:

- Variables: Years of Education [Ed...], BDI score Before Treat..., BDI after 4 weeks of dr..., BDI after 8 weeks of dr...
- Correlation Coefficients:  Pearson,  Kendall's tau-b,  Spearman
- Test of Significance:  Two-tailed,  One-tailed
- Flag significant correlations

ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filter	
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10	Biploar	Drug				52.00	-4.00	-5.00		
3	Subject11	Biploar	Placebo				40.00	2.00	1.00	Not	
4	Subject12	Dysthymic	Placebo				35.00	-2.00	-3.00	Not	
5	Subject13	Dysthymic	Placebo				41.00	-1.00	0.00	Not	
6	Subject14	Dysthymic	Placebo				35.00	4.00	5.00	Not	
7	Subject15	Biploar	Placebo				57.00	-6.00	-5.00	Not	
8	Subject16	MDD	Placebo				55.00	-10.00	-5.00	Not	
9	Subject17	Dysthymic	Placebo				39.00	0.00	0.00	Not	
10	Subject18	MDD	Placebo				55.00	1.00	0.00	Not	
11	Subject19	Biploar	Placebo				50.00	-3.00	-3.00	Not	
12	Subject2	MDD	Drug				5.00	-33.00	-56.00		
13	Subject20	Dysthymic	Drug				9.00	-33.00	-32.00		
14	Subject21	Biploar	Drug				51.00	-9.00	-8.00		
15	Subject22	Biploar	Drug				40.00	1.00	-2.00		
16	Subject23	Biploar	Placebo				50.00	-2.00	-2.00	Not	
17	Subject24	Dysthymic	Drug	Male	16.00	40.00	0.00	2.00	-40.00	-38.00	
18	Subject3	MDD	Drug	Male	10.00	59.00	5.00	9.00	-54.00	-50.00	
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00	-25.00	-45.00	





# Correlations

\*Output2 [Document2] - SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output

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- T-Test
- T-Test
- T-Test
- T-Test
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  - Title
  - Notes
  - Correlations

### Correlations

		Years of Education	BDI score Before Treatment	BDI after 4 weeks of drug or placebo	BDI after 8 weeks of drug or placebo
Years of Education	Pearson Correlation	1	-.703**	-.046	.081
	Sig. (2-tailed)		.000	.833	.712
	N	23	23	23	23
BDI score Before Treatment	Pearson Correlation	-.703**	1	.277	.138
	Sig. (2-tailed)	.000		.190	.520
	N	23	24	24	24
BDI after 4 weeks of drug or placebo	Pearson Correlation	-.046	.277	1	.918**
	Sig. (2-tailed)	.833	.190		.000
	N	23	24	24	24
BDI after 8 weeks of drug or placebo	Pearson Correlation	.081	.138	.918**	1
	Sig. (2-tailed)	.712	.520	.000	
	N	23	24	24	24

\*\* . Correlation is significant at the 0.01 level (2-tailed).

SPSS Statistics Processor is ready

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# Do NOT Run Correlations on Categorical Variables!!

The screenshot displays the SPSS Statistics Data Editor interface. The main window shows a list of variables with their properties:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	None	8	Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	None	None	8	Right
4	Sex	Numeric	8	2	Sex	None	None	8	Right
5	Education	Numeric	8	2	Years of Education	None	None	8	Right
6	BDIpre	Numeric	8	2	BDI score Before Treatment	None	None	8	Right
7	BDIWk4	Numeric	8	2	BDI after 4 weeks of drug or placebo	None	None	8	Right
8	BDIWk8	Numeric	8	2	BDI after 8 weeks of drug or placebo	None	None	8	Right

The 'Value Labels' dialog box is open, showing the following configuration:

- Value: 2
- Label: Placebo
- 1.00 = "Drug"

An arrow points from the text **Important: THESE VALUES ARE ARBITRARY!!** to the '1.00 = "Drug"' entry in the dialog box.

SPSS Statistics Processor is ready

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# Correlations

## What NOT To Do

SPSS\_Lecture\_File.sav [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1: PreToWk4 -33.0 Visible: 11 of 11 Variables

	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject16	MDD	Placebo					55.00	-10.00	-5.00	Not
3	Subject18	MDD	Placebo					55.00	1.00	0.00	Not
4	Subject2	MDD	Drug					5.00	-33.00	-56.00	
5	Subject3	MDD	Drug					9.00	-54.00	-50.00	
6	Subject4	MDD	Drug					2.00	-25.00	-45.00	
7	Subject6	MDD	Placebo					55.00	-2.00	-1.00	Not
8	Subject9	MDD	Placebo					37.00	3.00	-2.00	Not
9	Subject10	Biploar	Drug					52.00	-4.00	-5.00	
10	Subject11	Biploar	Placebo					40.00	2.00	1.00	Not
11	Subject15	Biploar	Placebo					57.00	-6.00	-5.00	Not
12	Subject19	Biploar	Placebo					50.00	-3.00	-3.00	Not
13	Subject21	Biploar	Drug					51.00	-9.00	-8.00	
14	Subject22	Biploar	Drug					40.00	1.00	-2.00	
15	Subject23	Biploar	Placebo					50.00	-2.00	-2.00	Not
16	Subject7	Biploar	Drug					45.00	0.00	0.00	
17	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not
18	Subject13	Dysthymic	Placebo	Male	18.00	41.00	40.00	41.00	-1.00	0.00	Not
19	Subject14	Dysthymic	Placebo	Female	18.00	30.00	34.00	35.00	4.00	5.00	Not

**Bivariate Correlations**

Variables:

- Sex [Sex]
- Change from Pre Treat...

Correlation Coefficients

Pearson  Kendall's tau-b  Spearman

Test of Significance

Two-tailed  One-tailed

Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

SPSS Statistics Processor is ready

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# Correlations

## What NOT To Do

		Sex	Change from Pre Treatment to Week 8 (Week 8 - Pre)
Sex	Pearson Correlation	1	.537**
	Sig. (2-tailed)		.007
	N	24	24
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Pearson Correlation	.537**	1
	Sig. (2-tailed)	.007	
	N	24	24

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The screenshot also shows the SPSS menu bar (File, Edit, View, Data, Transform, Insert, Format, Analyze, Graphs, Utilities, Add-ons, Window, Help) and a taskbar at the bottom with various open applications like Gmail, Mail, and SPSS.

