Introduction to SPSS

Katie Handwerger
Why n' How
February 19, 2009

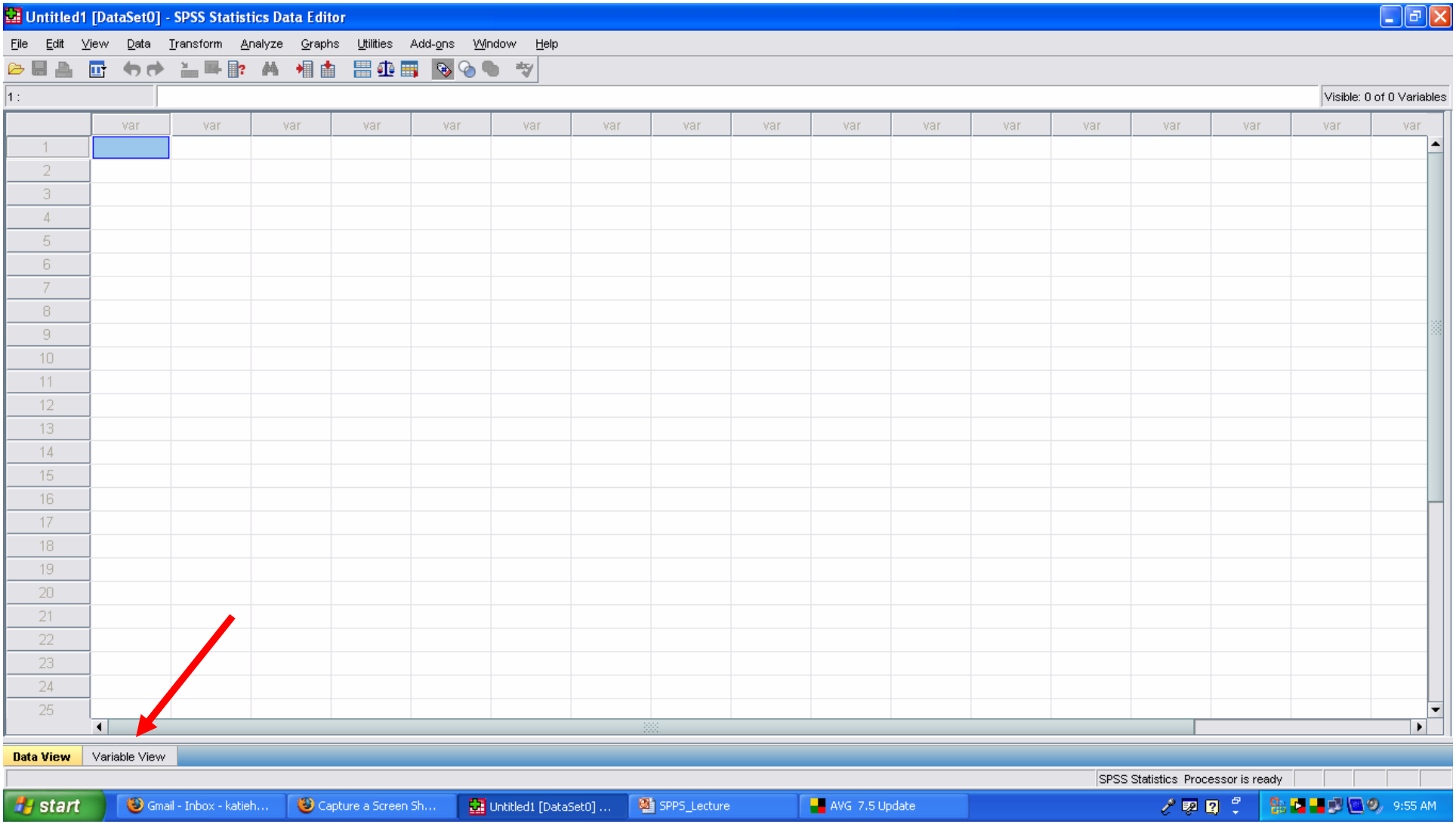
Overview

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

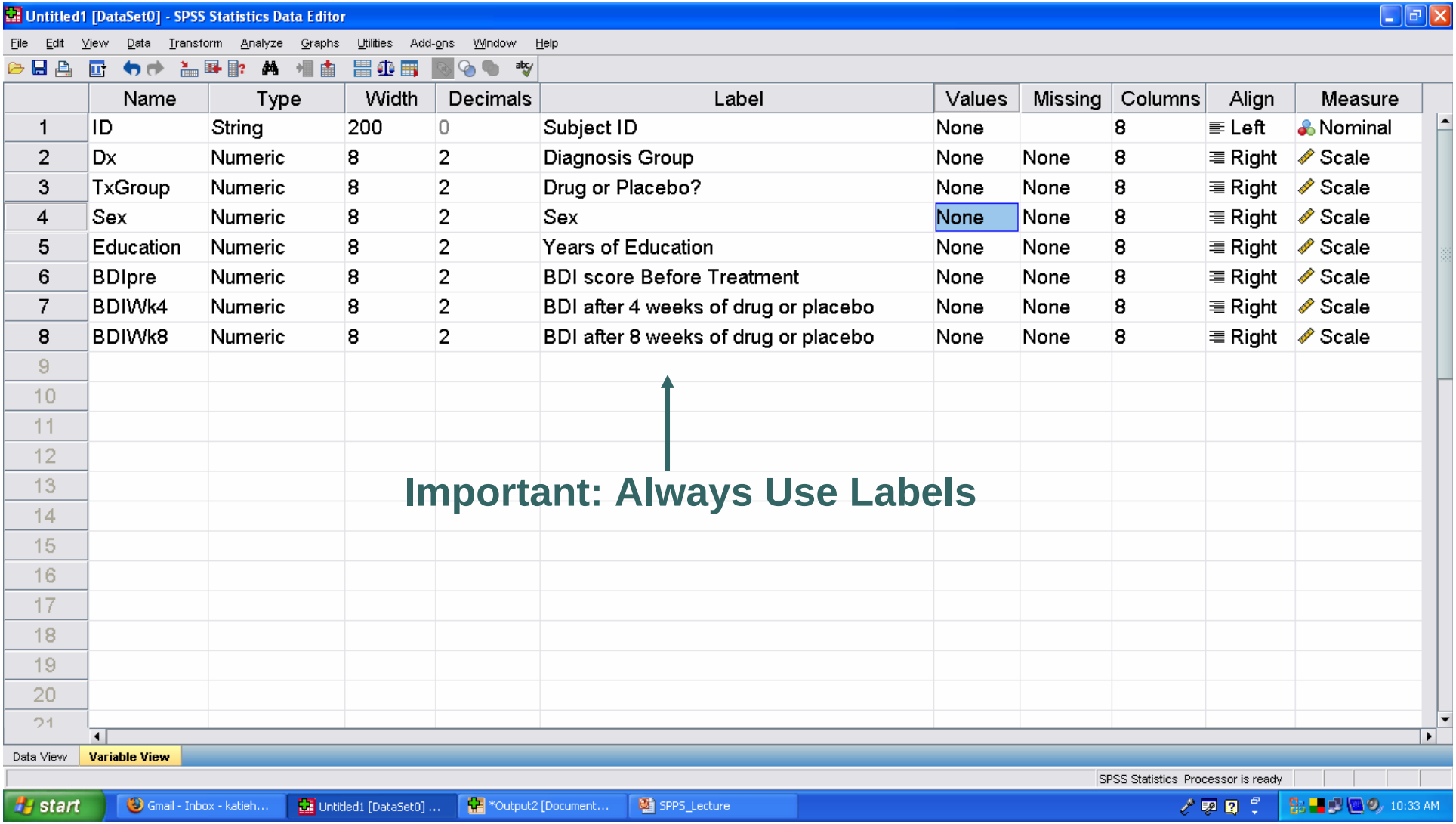
Study

- 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

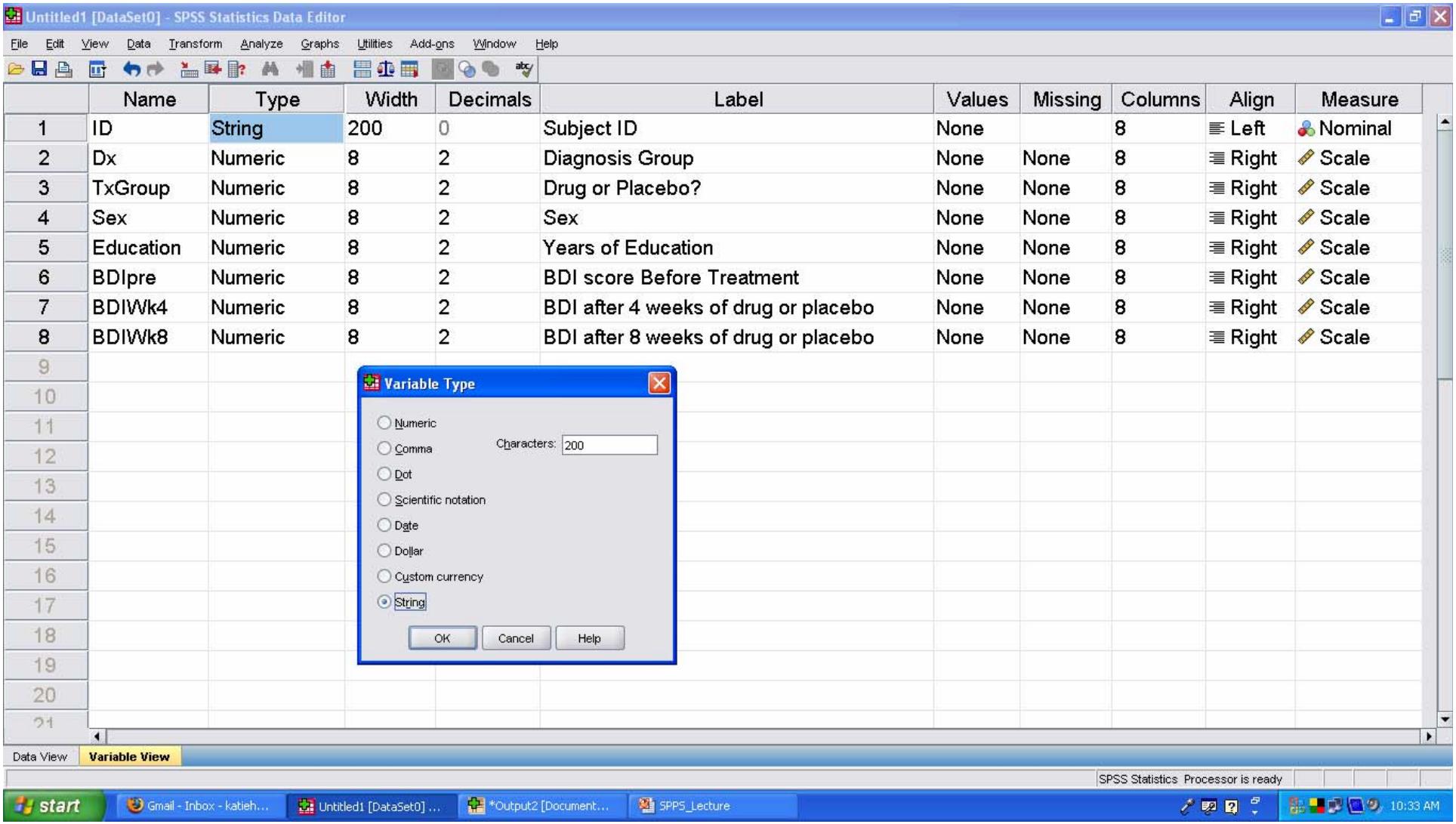


Setting Up A Data File

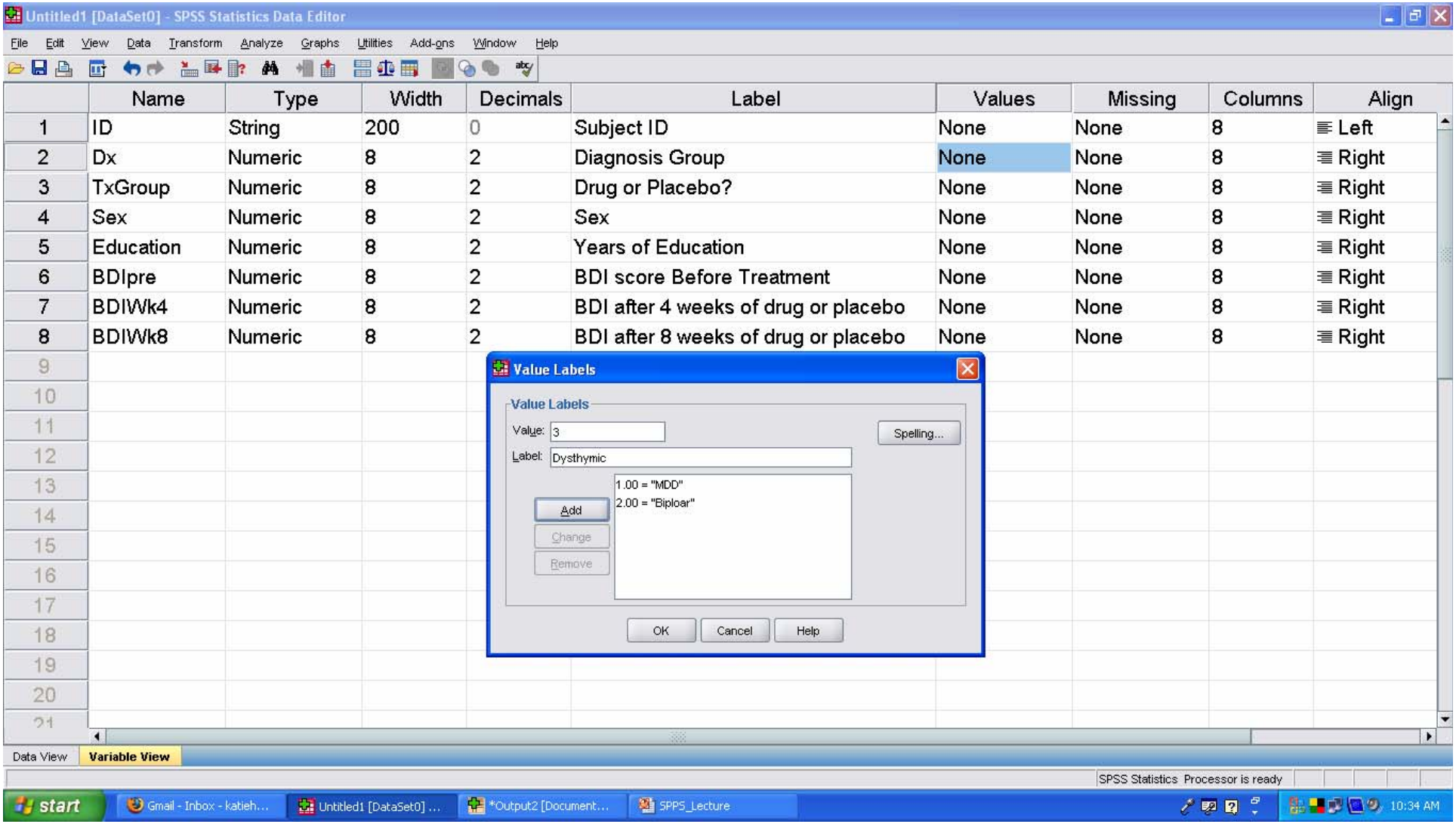


	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1	ID	String	200	0	Subject ID	None		8	Left	Nominal
2	Dx	Numeric	8	2	Diagnosis Group	None	None	8	Right	Scale
3	TxGroup	Numeric	8	2	Drug or Placebo?	None	None	8	Right	Scale
4	Sex	Numeric	8	2	Sex	None	None	8	Right	Scale
5	Education	Numeric	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										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

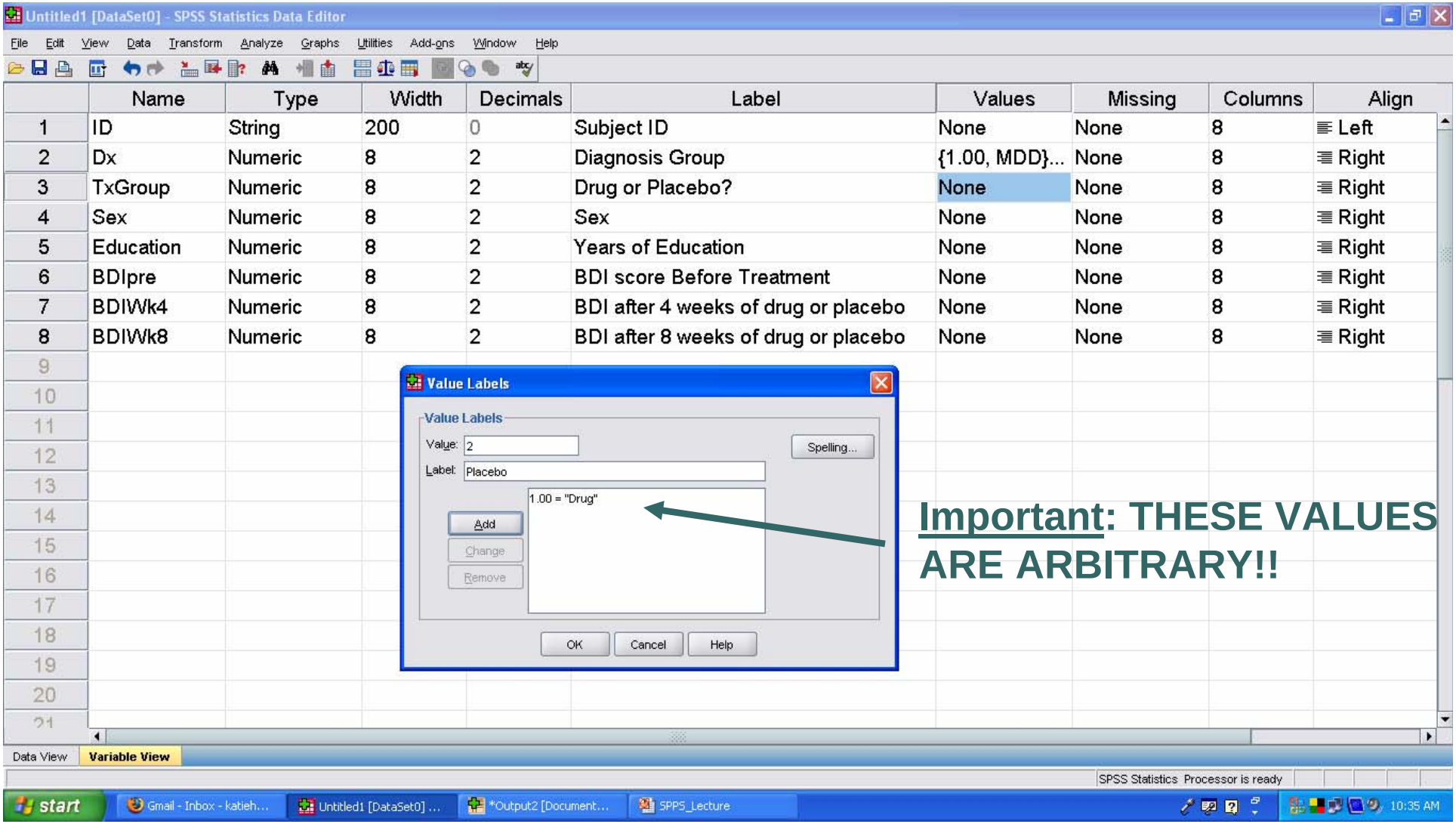
Setting Variable Types



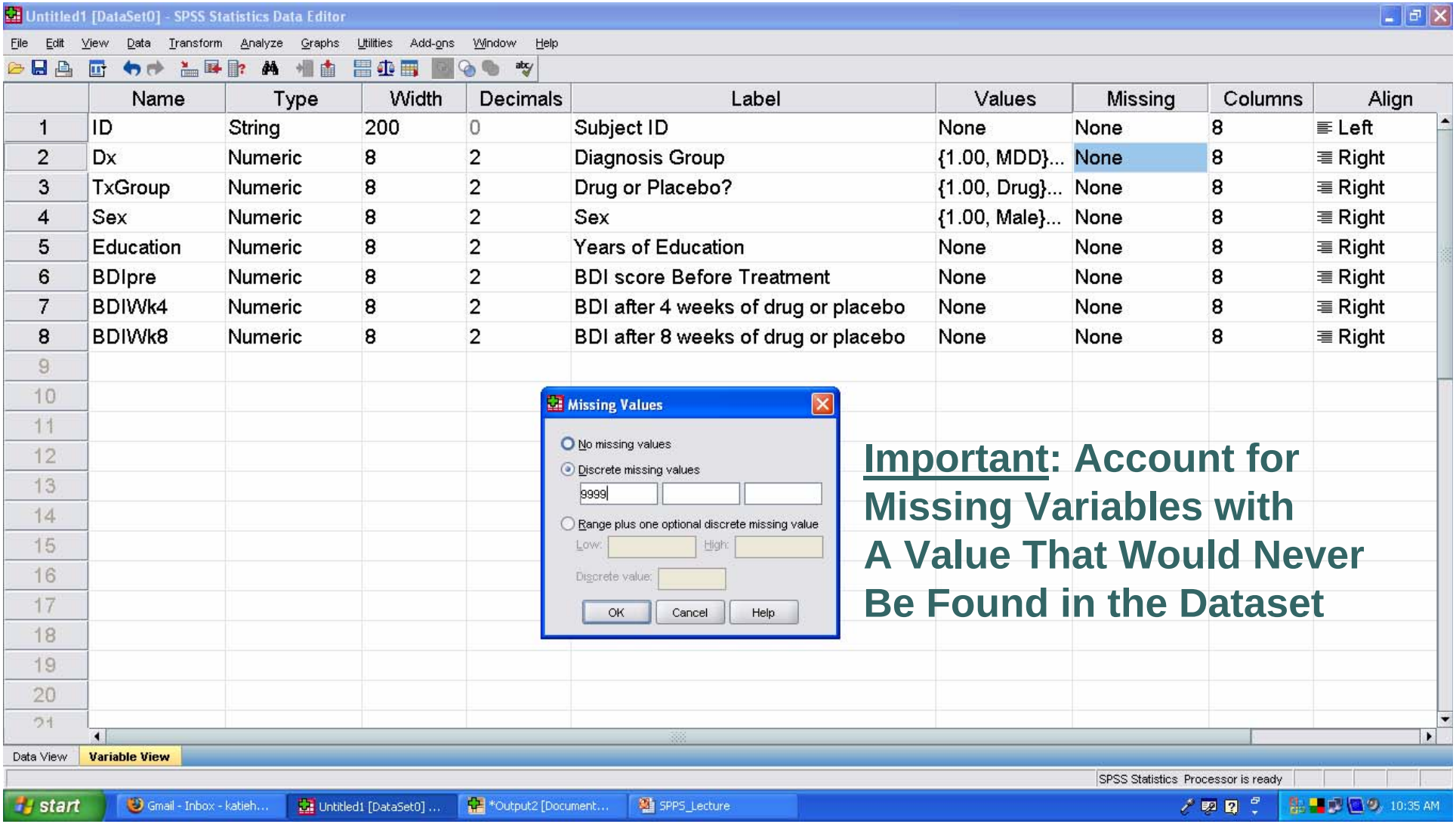
Setting Value Labels



Setting Value Labels

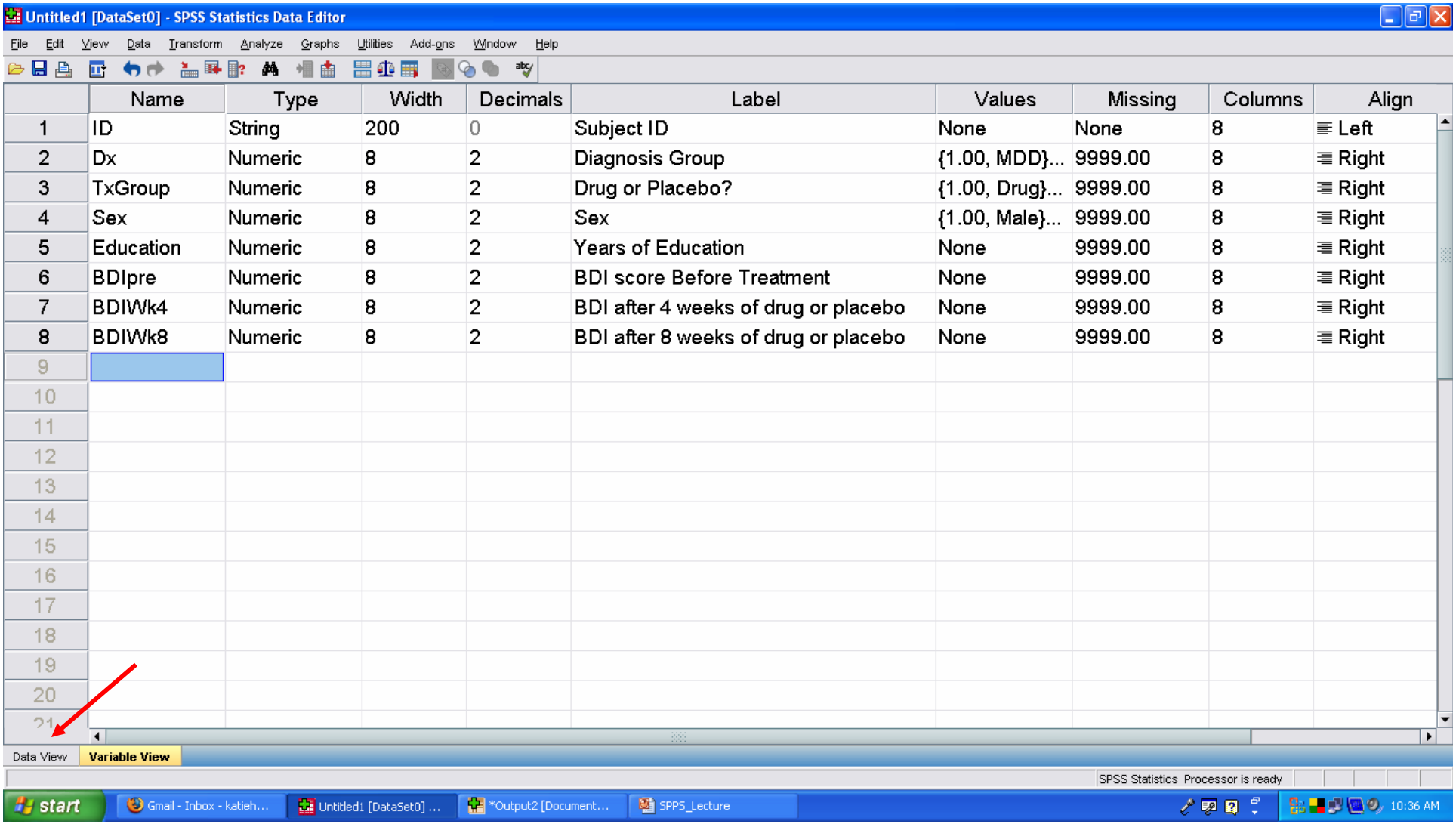


Accounting for Missing Variables



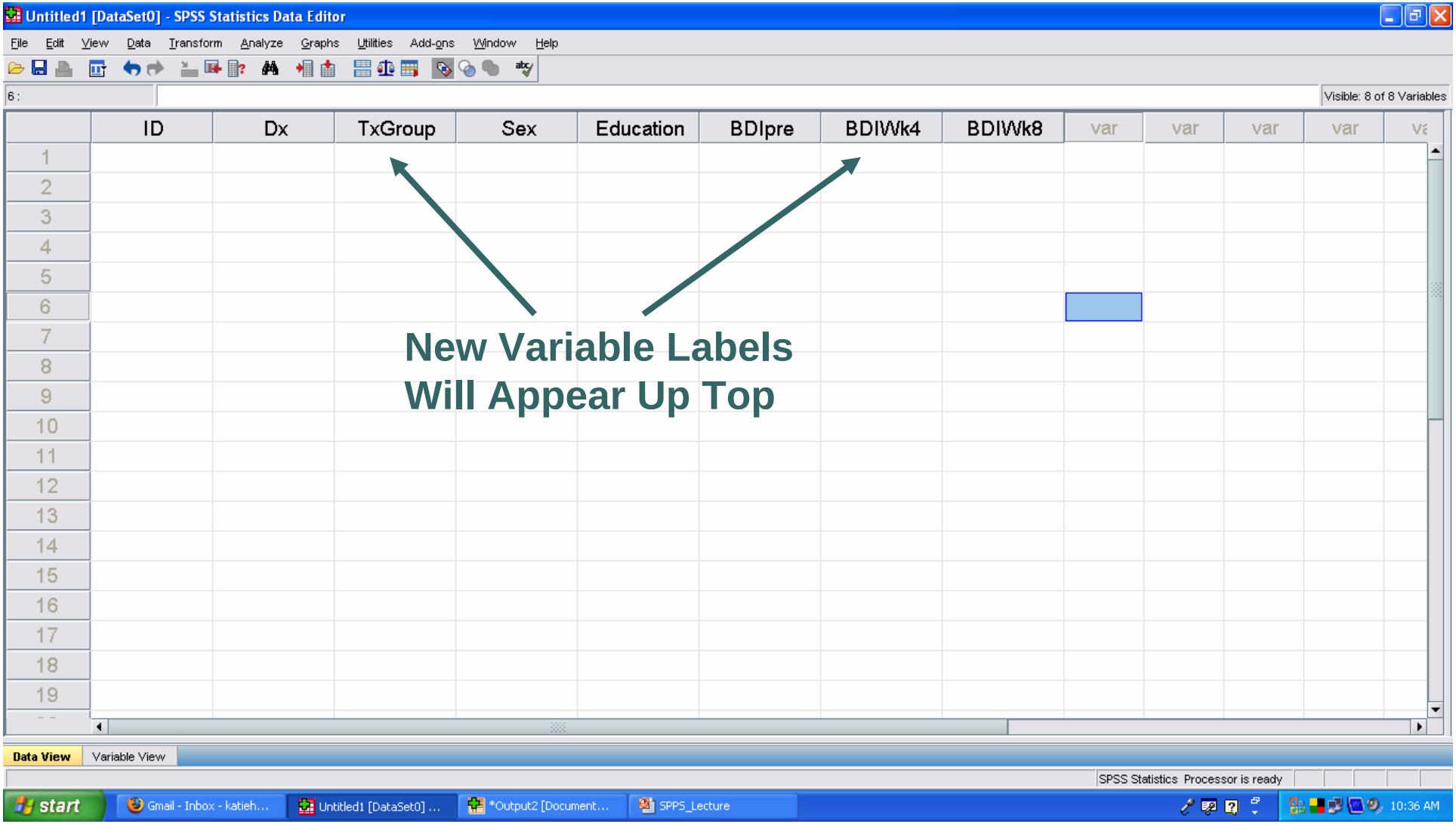
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	None	8	Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	None	8	Right
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	None	8	Right
5	Education	Numeric	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

Setting Up A Date File

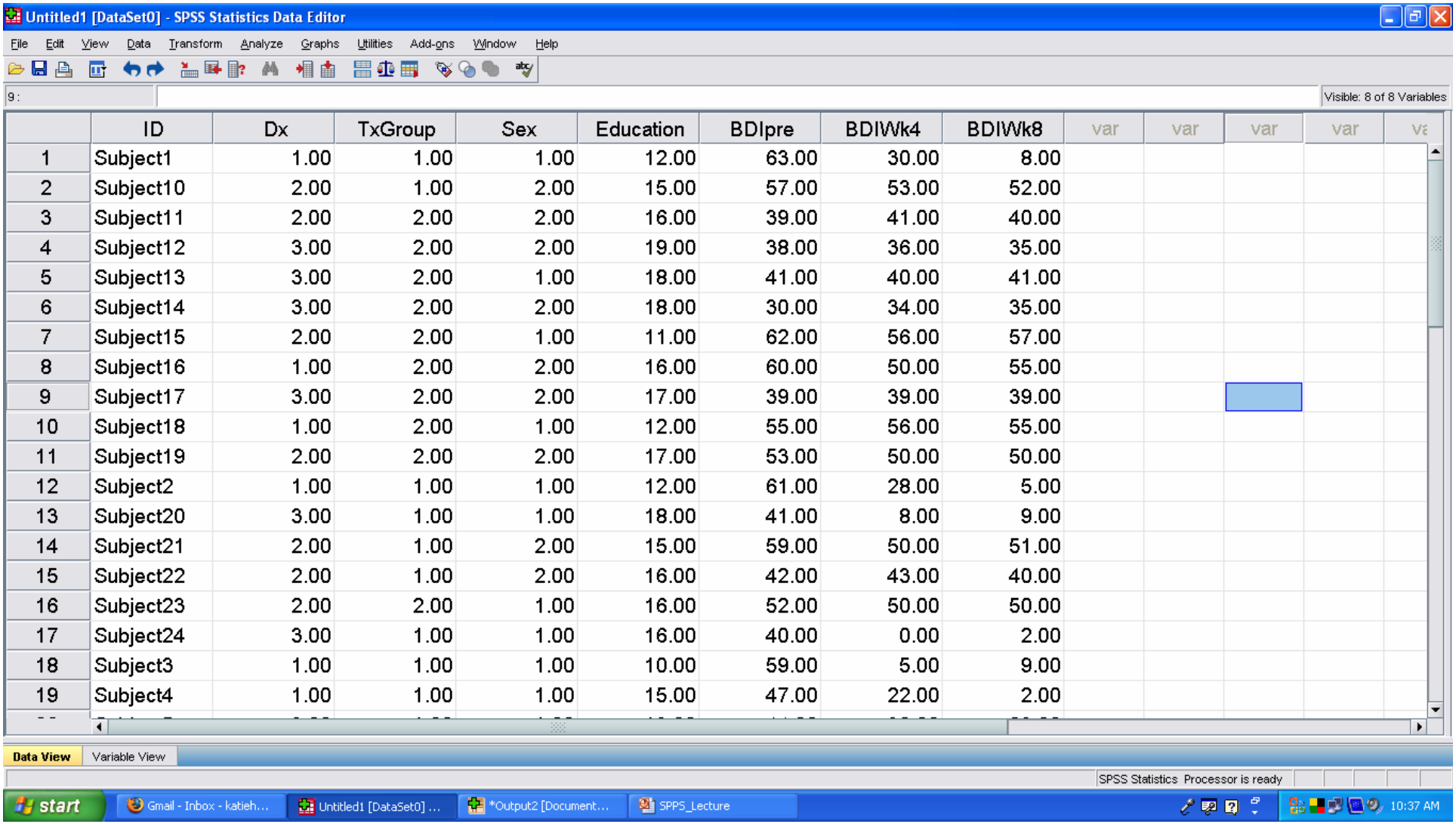


	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	ID	String	200	0	Subject ID	None	None	8	Left
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	9999.00	8	Right
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	9999.00	8	Right
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	9999.00	8	Right
5	Education	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									

Setting Up A Data File

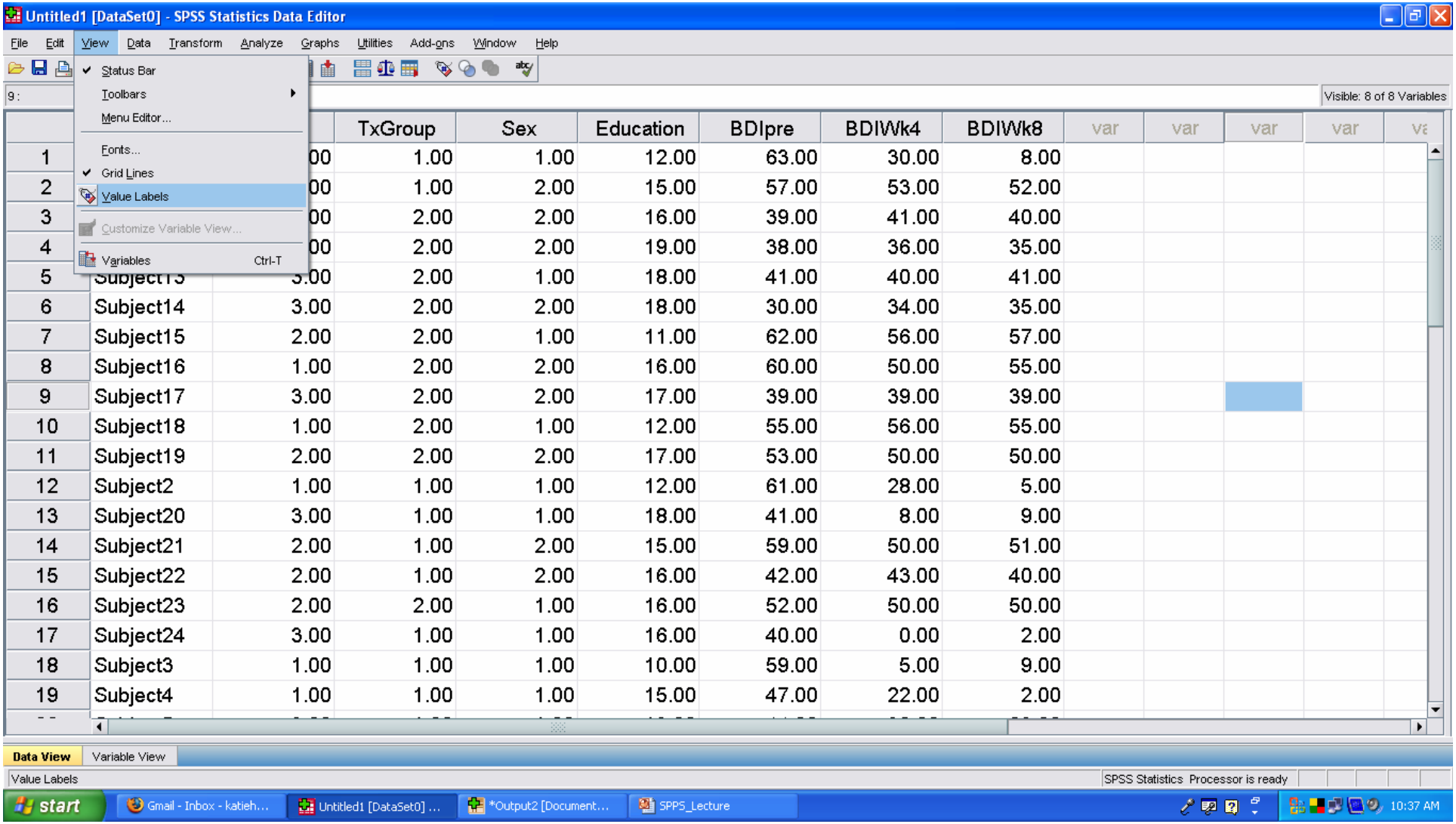


Setting Up A Data File

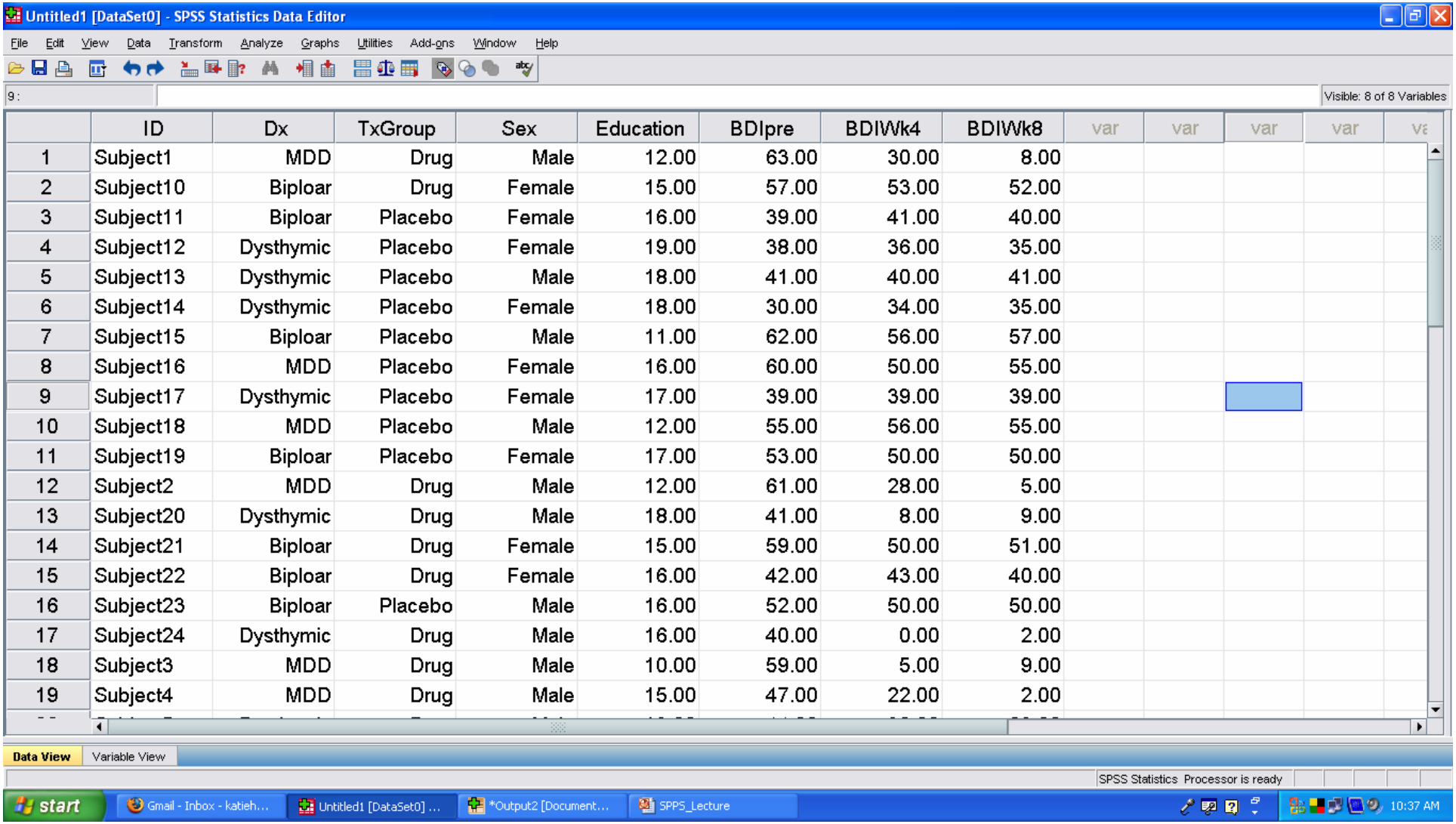


	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	va
1	Subject1	1.00	1.00	1.00	12.00	63.00	30.00	8.00					
2	Subject10	2.00	1.00	2.00	15.00	57.00	53.00	52.00					
3	Subject11	2.00	2.00	2.00	16.00	39.00	41.00	40.00					
4	Subject12	3.00	2.00	2.00	19.00	38.00	36.00	35.00					
5	Subject13	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					

Viewing Value Labels



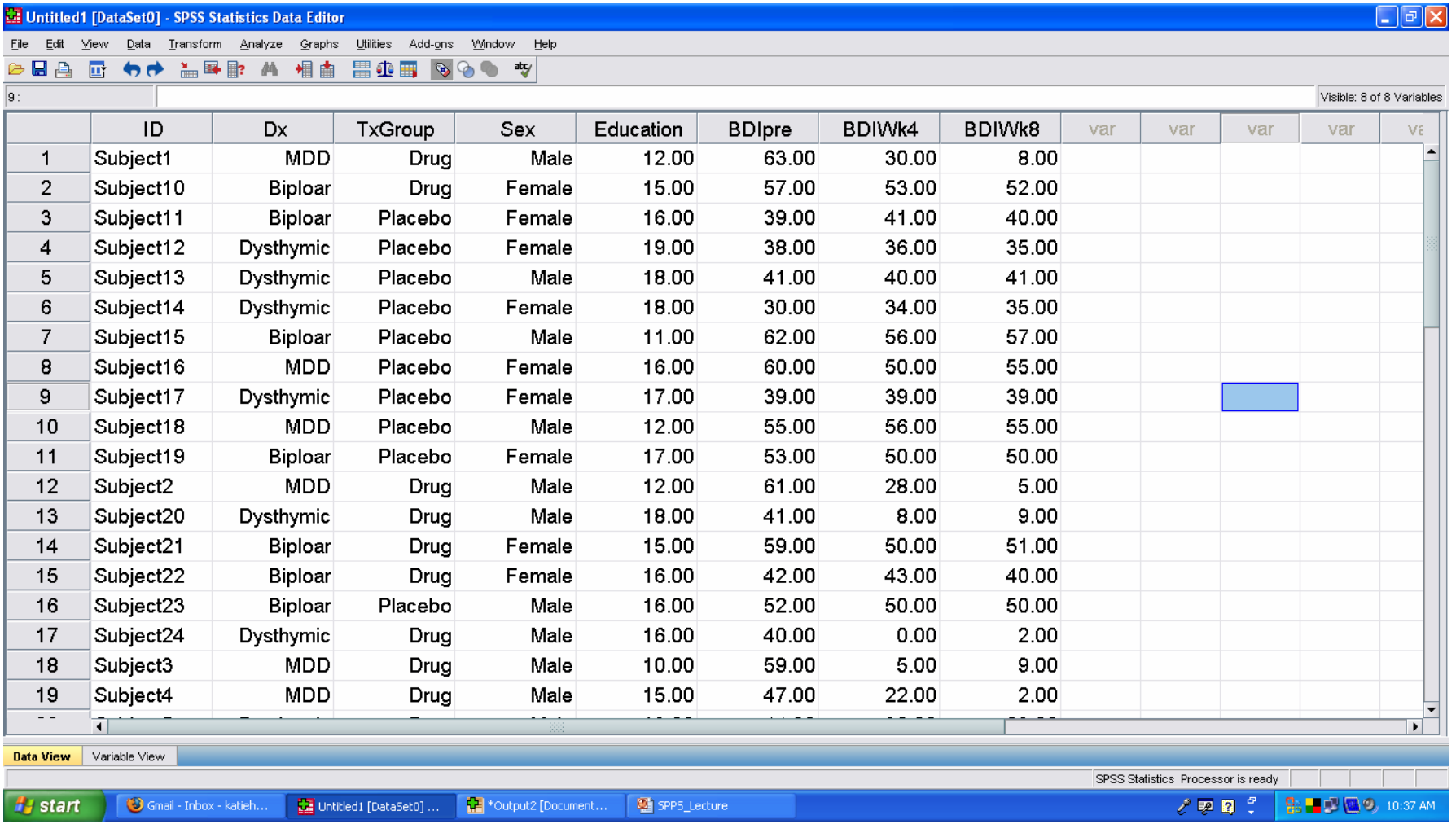
Viewing Value Labels



	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	va
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					

Now we have our data set up

What can we do with it???

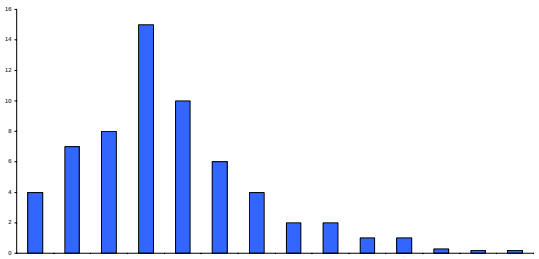


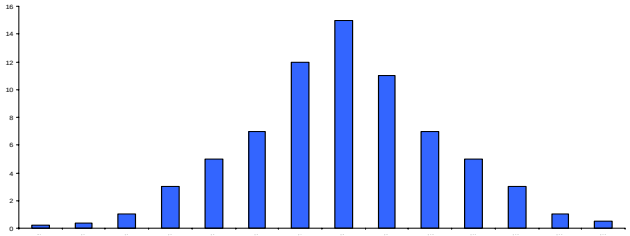
	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	va
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00					
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00					
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00					
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	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

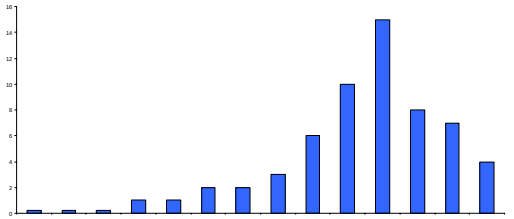
- **Mean**
- **Median**
- **Mode**
- **Range**
- **Skewness**
  - Measure of the asymmetry of the probability distribution
  - Good way to check for outliers

Negative Skew

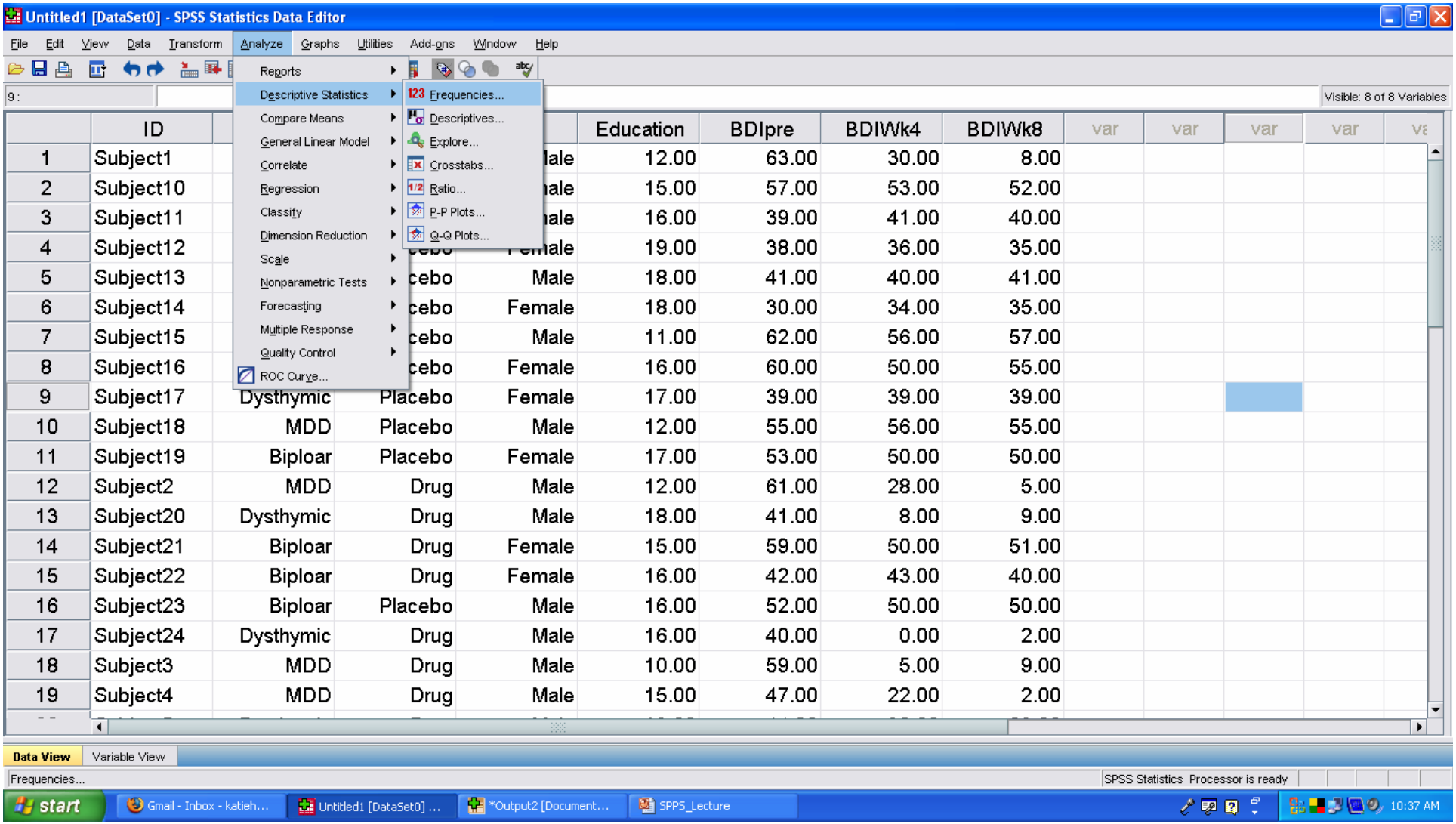




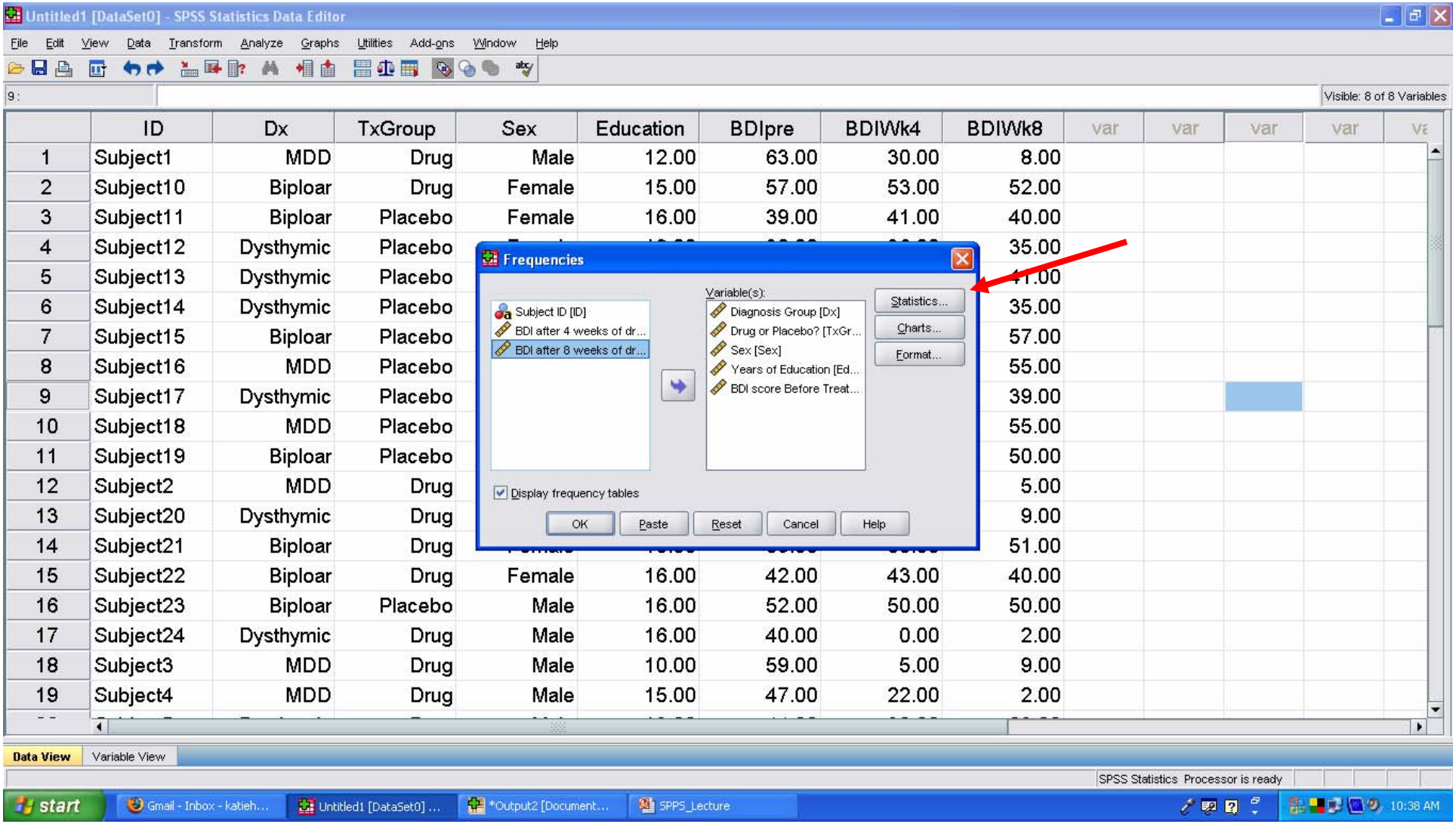
Positive Skew



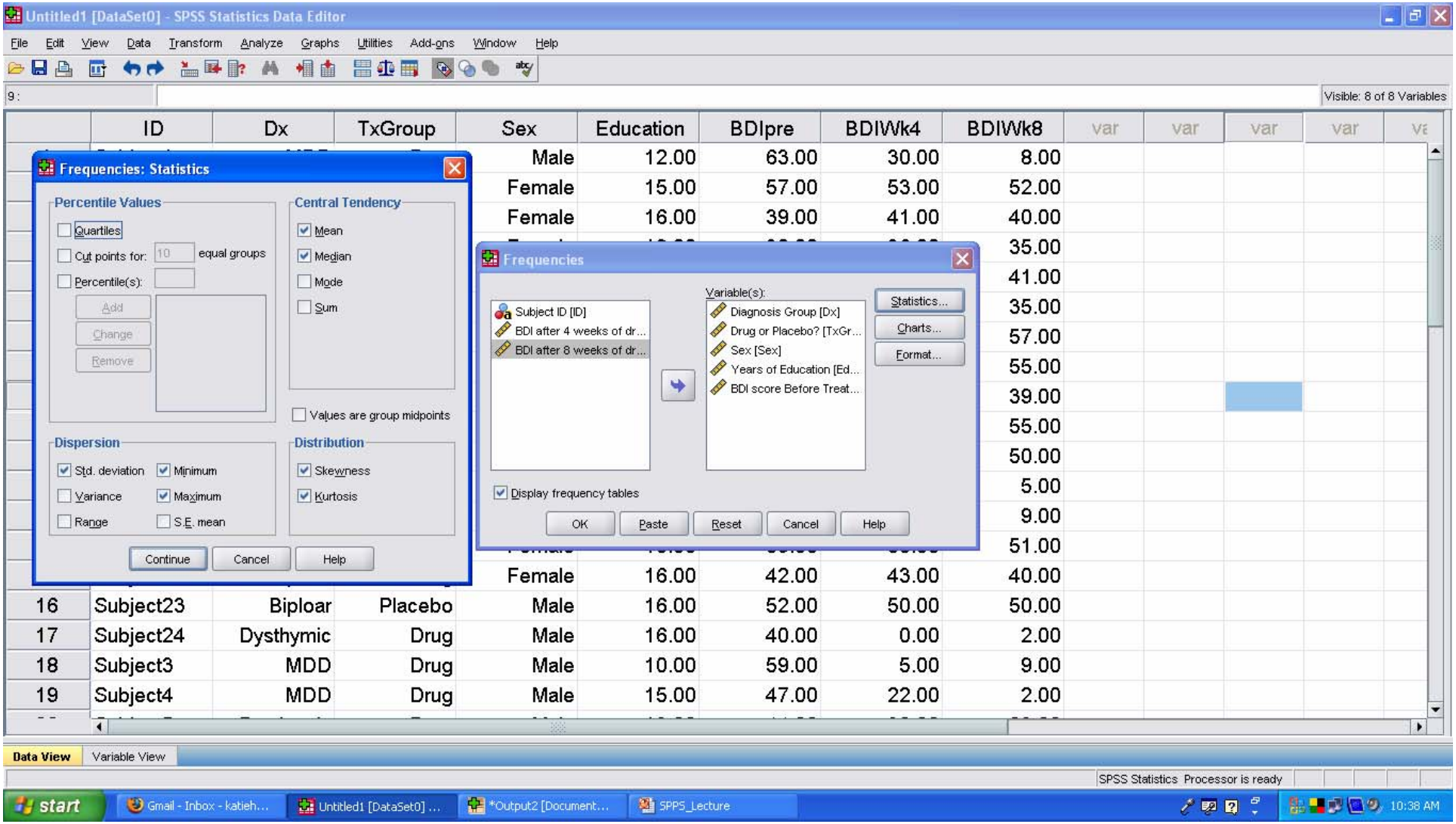
Running Descriptives



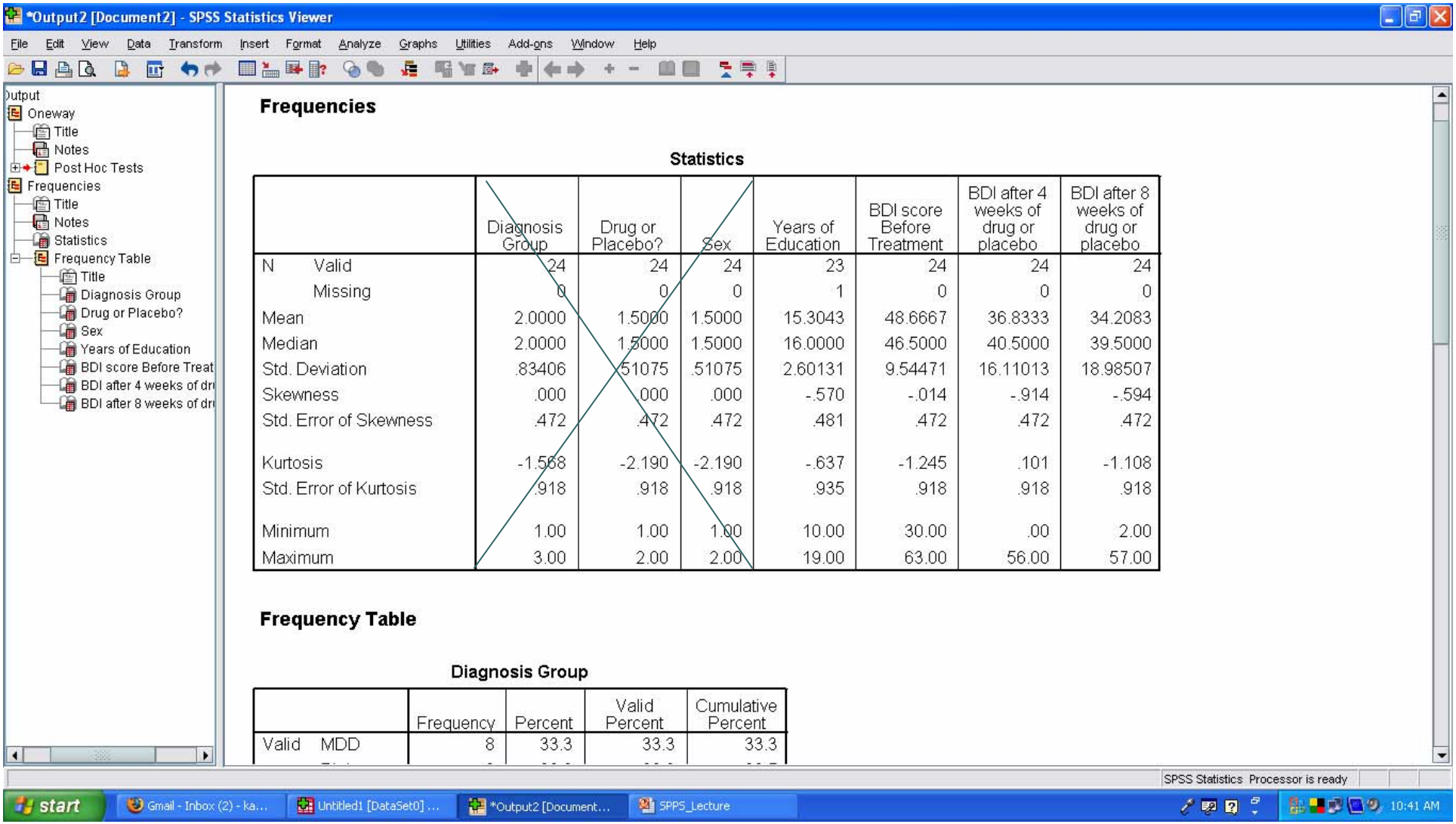
Running Descriptives



Running Descriptives



Descriptives Output



Frequencies

Statistics

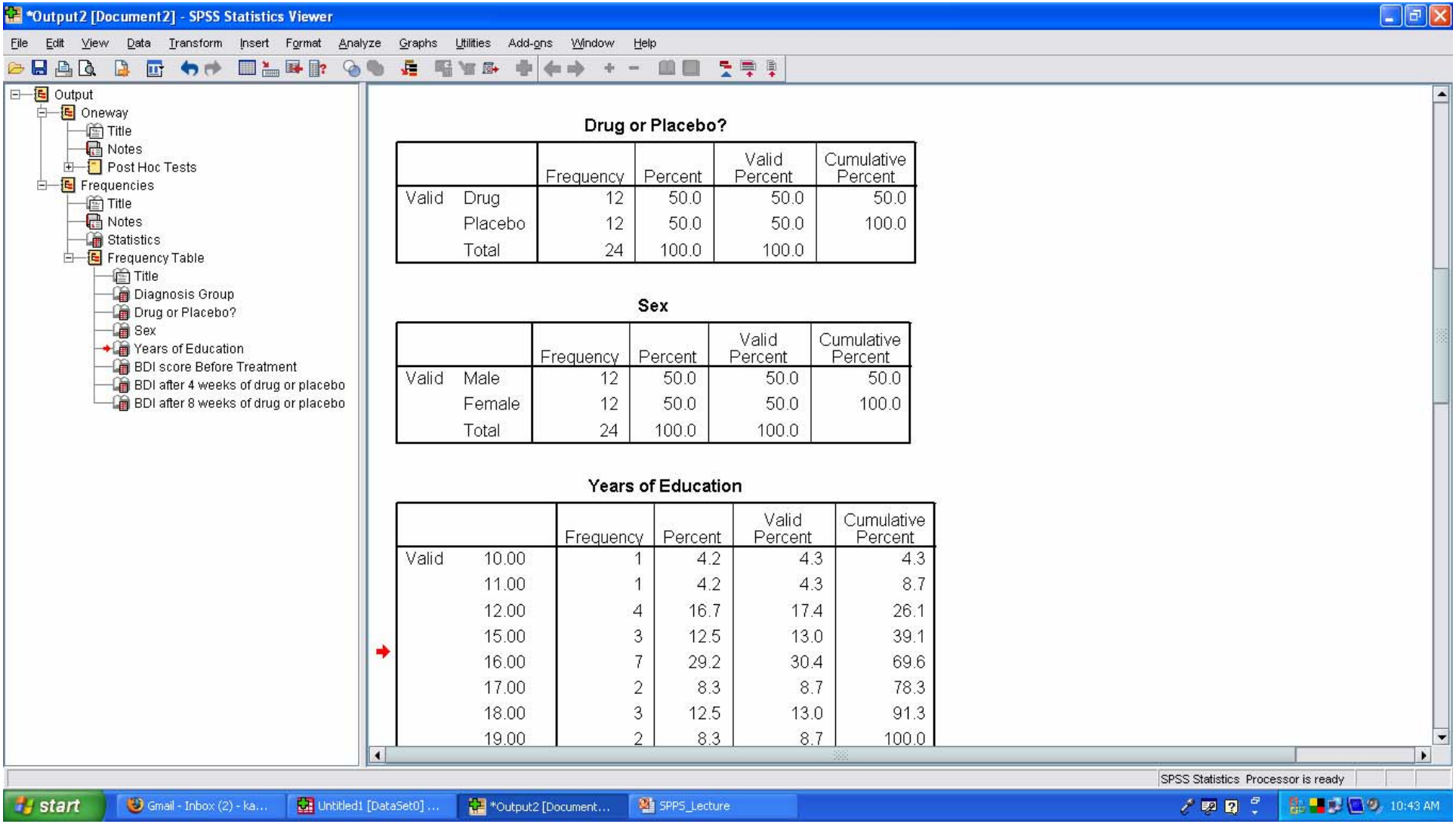
		Diagnosis Group	Drug or Placebo?	Sex	Years of Education	BDI score Before Treatment	BDI after 4 weeks of drug or placebo	BDI after 8 weeks of drug or placebo
N	Valid	24	24	24	23	24	24	24
	Missing	0	0	0	1	0	0	0
Mean		2.0000	1.5000	1.5000	15.3043	48.6667	36.8333	34.2083
Median		2.0000	1.5000	1.5000	16.0000	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

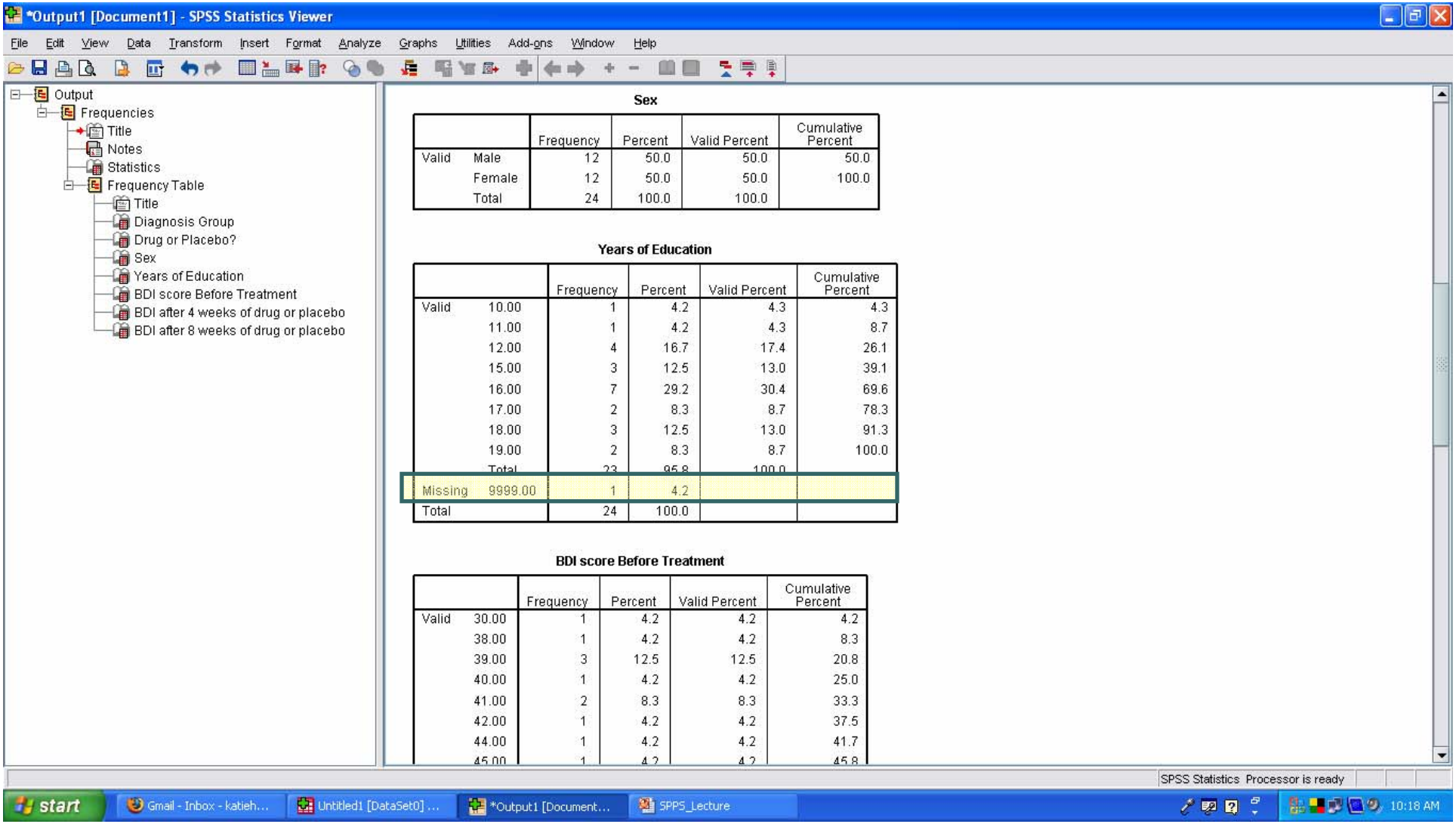
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MDD	8	33.3	33.3	33.3

Descriptives Output

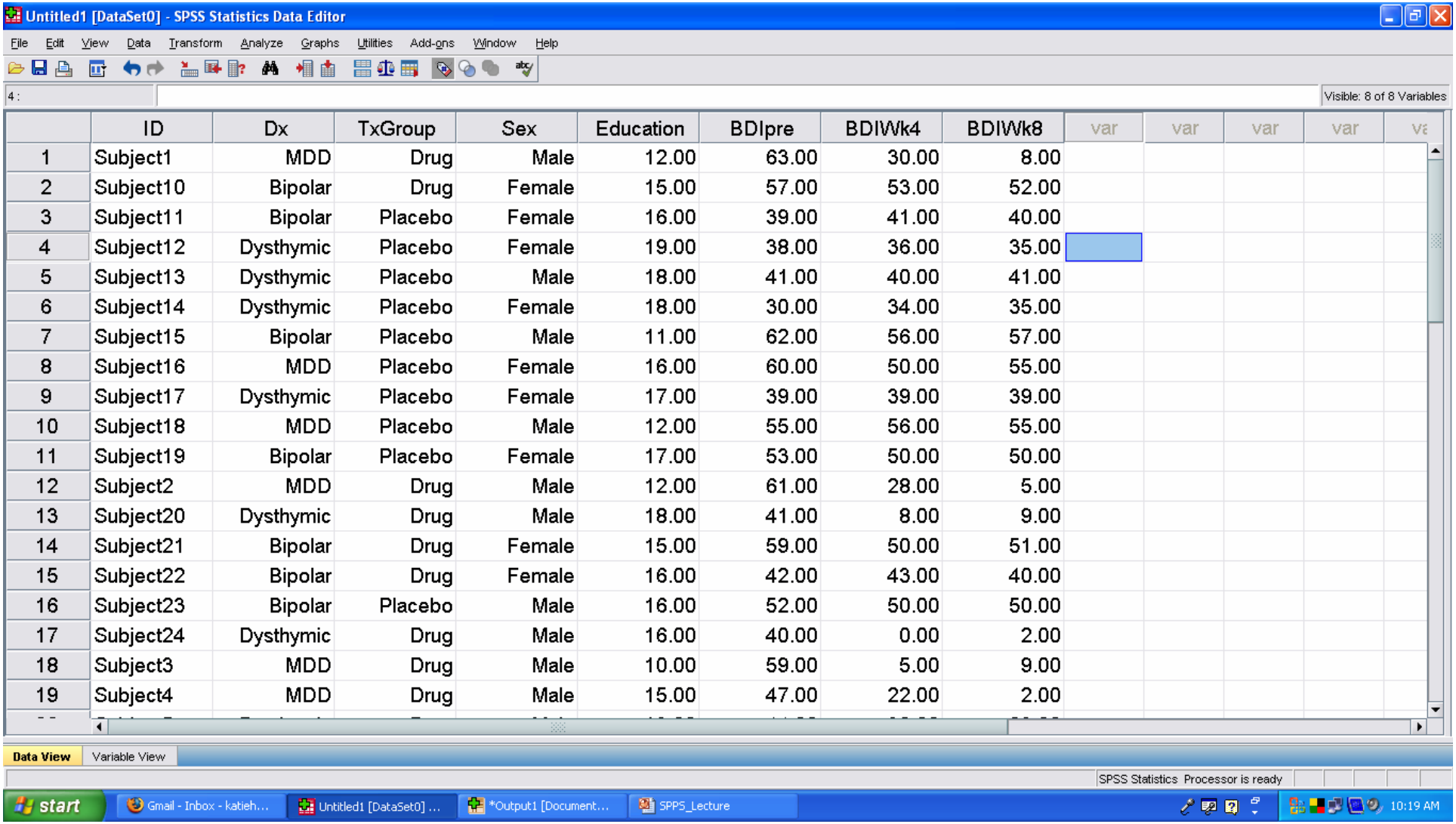


Descriptives Output

Missing Values Accounted For



Selecting Only Certain Cases

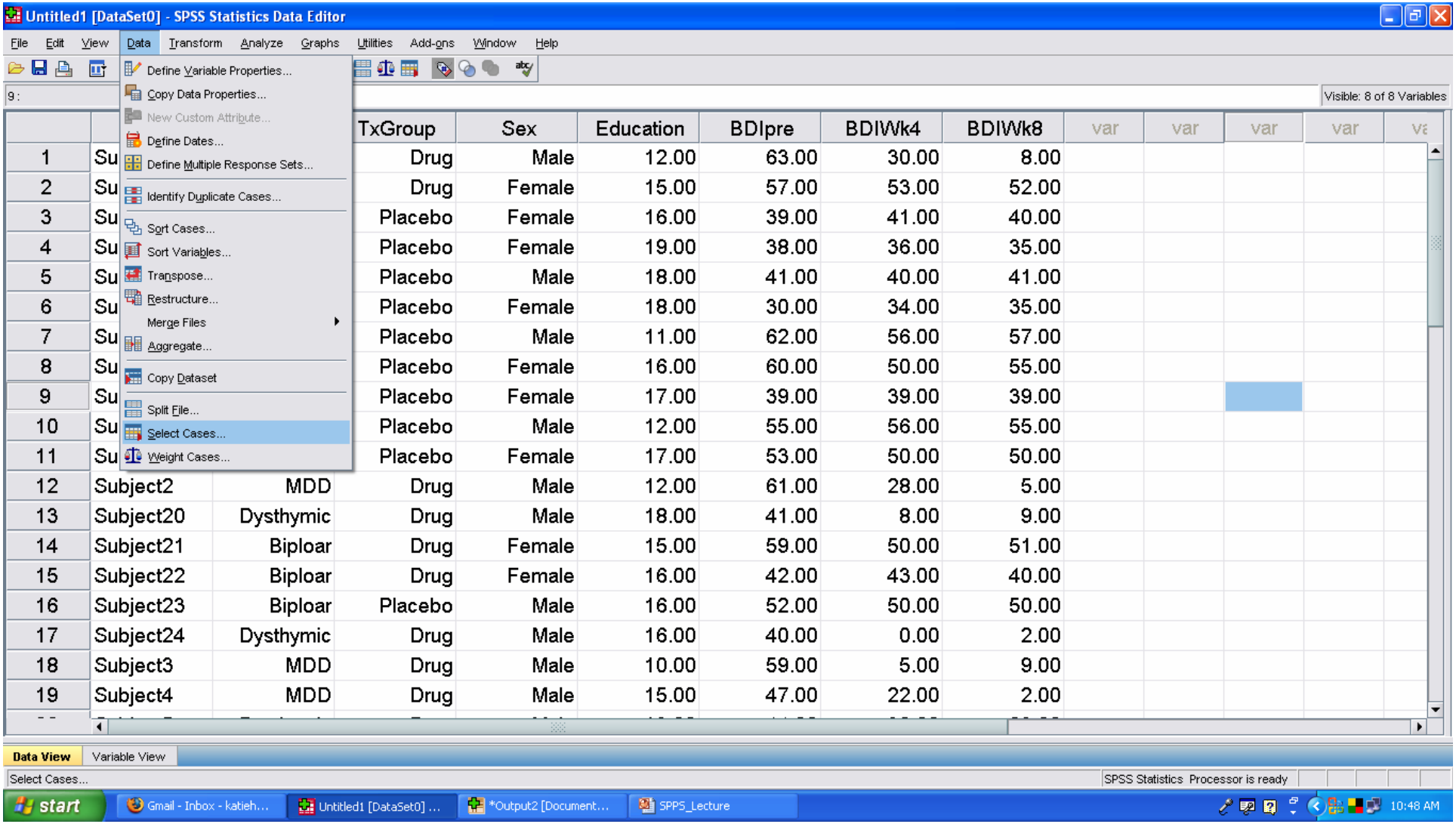


	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var	va
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00					
2	Subject10	Bipolar	Drug	Female	15.00	57.00	53.00	52.00					
3	Subject11	Bipolar	Placebo	Female	16.00	39.00	41.00	40.00					
4	Subject12	Dysthymic	Placebo	Female	19.00	38.00	36.00	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

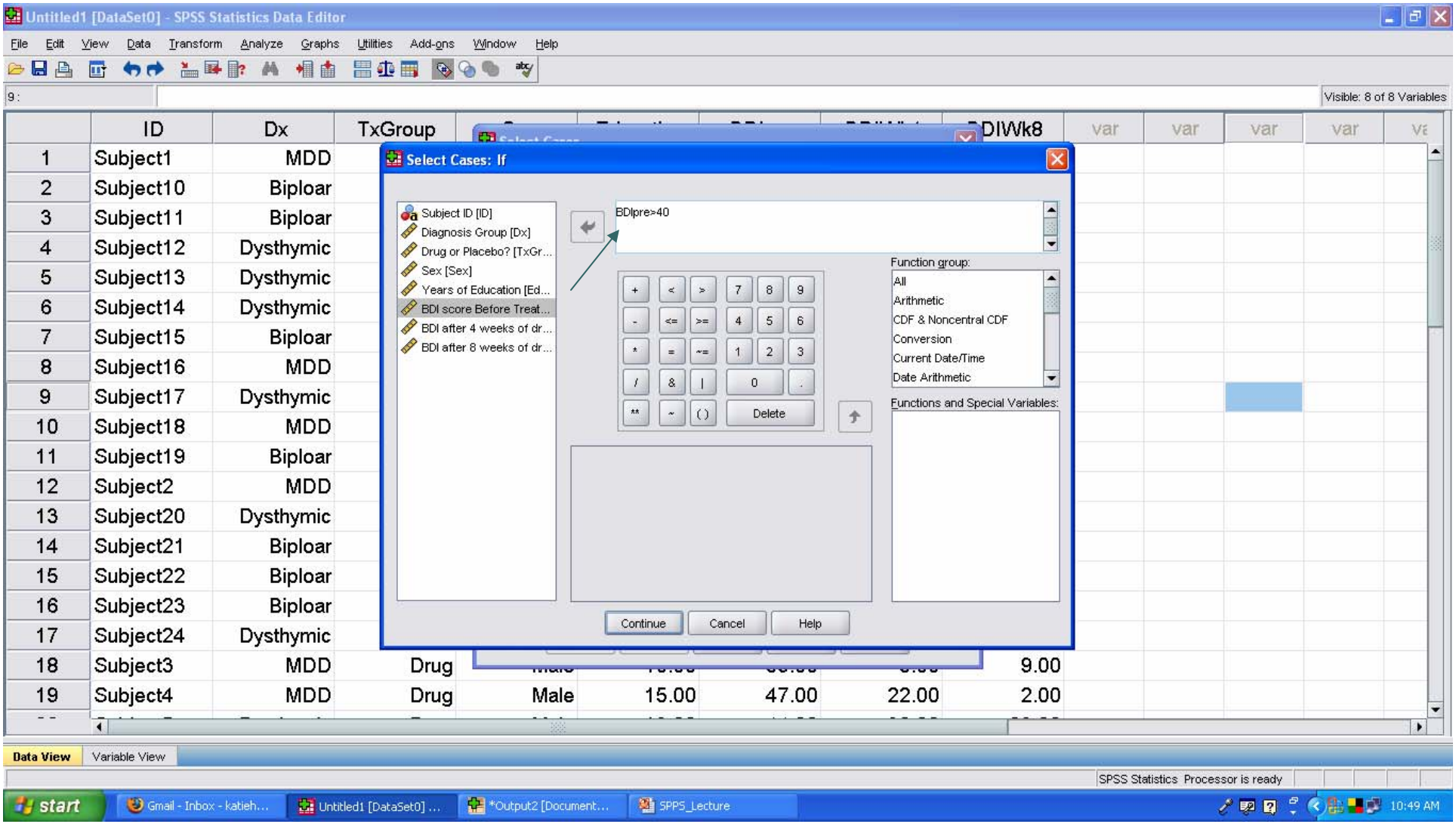
- What if I only want to include a certain population in my analyses?
  - i.e. people with ***SEVERE*** Depression
    - Defined as: BDI>40 at pre treatment

Selecting Only Certain Cases



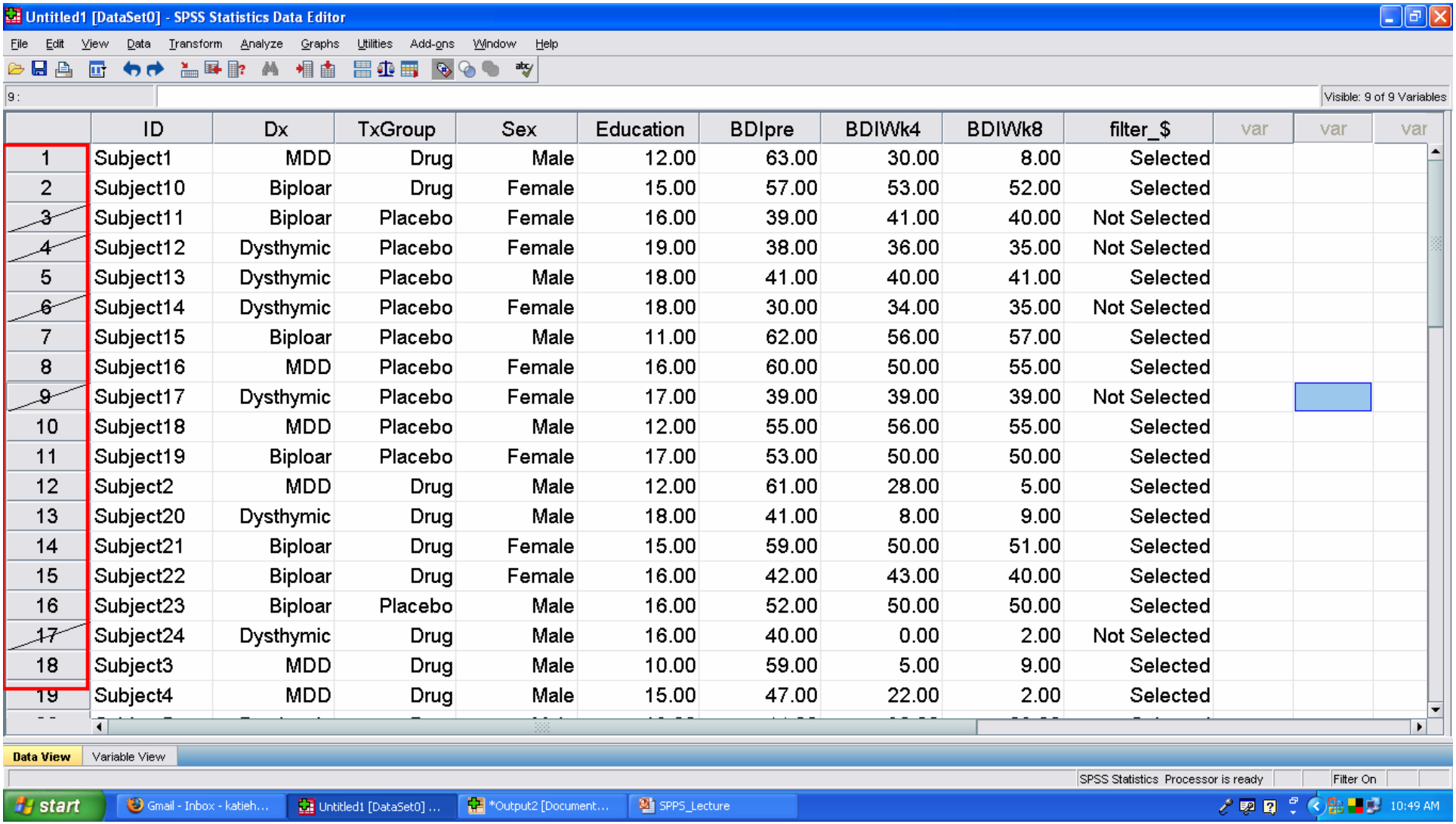
			TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8
1	Su		Drug	Male	12.00	63.00	30.00	8.00
2	Su		Drug	Female	15.00	57.00	53.00	52.00
3	Su		Placebo	Female	16.00	39.00	41.00	40.00
4	Su		Placebo	Female	19.00	38.00	36.00	35.00
5	Su		Placebo	Male	18.00	41.00	40.00	41.00
6	Su		Placebo	Female	18.00	30.00	34.00	35.00
7	Su		Placebo	Male	11.00	62.00	56.00	57.00
8	Su		Placebo	Female	16.00	60.00	50.00	55.00
9	Su		Placebo	Female	17.00	39.00	39.00	39.00
10	Su		Placebo	Male	12.00	55.00	56.00	55.00
11	Su		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

Selecting Only Certain Cases



	ID	Dx	TxGroup					
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					9.00
19	Subject4	MDD	Drug	Male	15.00	47.00	22.00	2.00

Selecting Only Certain Cases

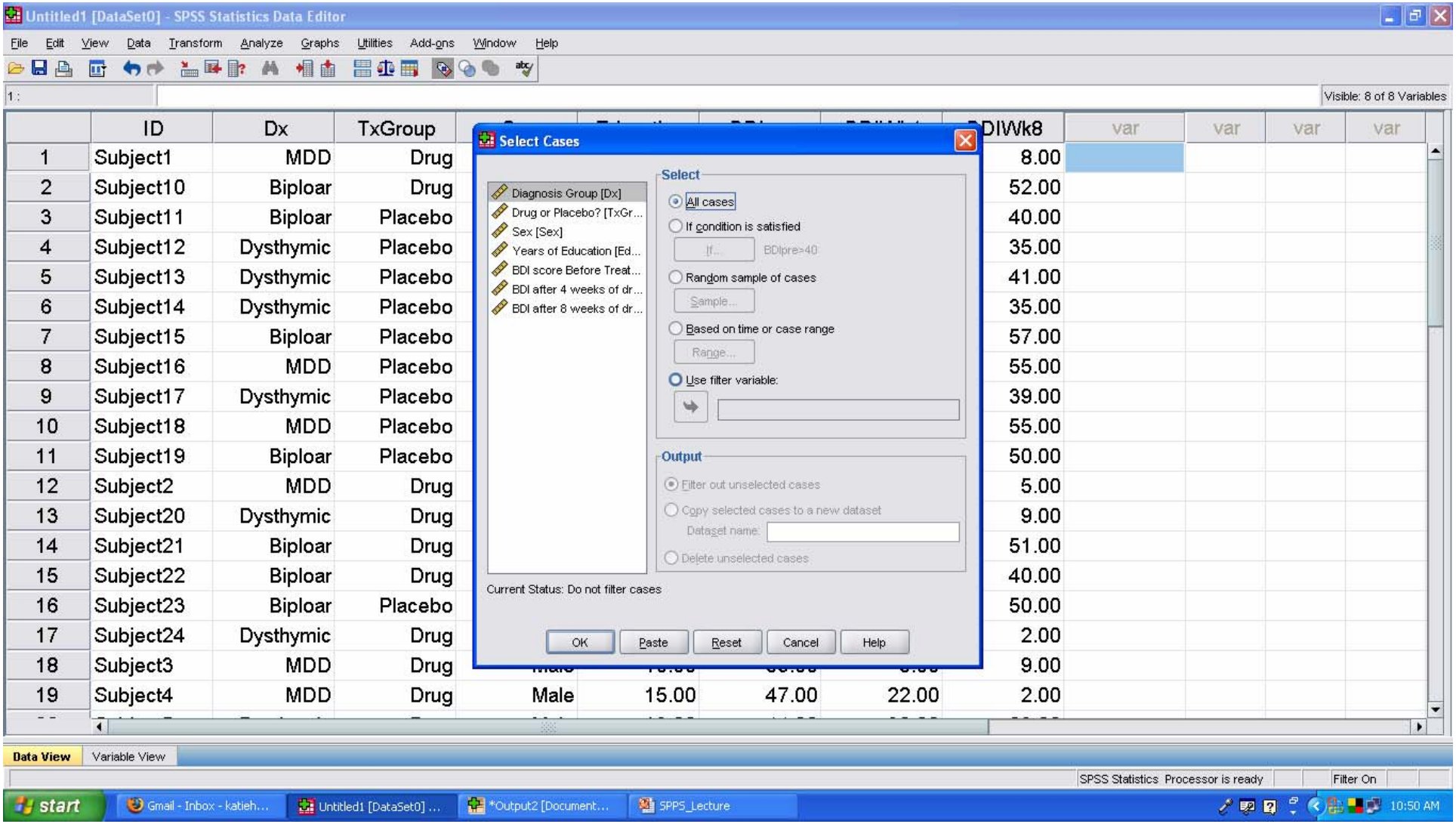


	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	filter_$	var	var	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	Selected			
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	Selected			
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	Not Selected			
4	Subject12	Dysthymic	Placebo	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

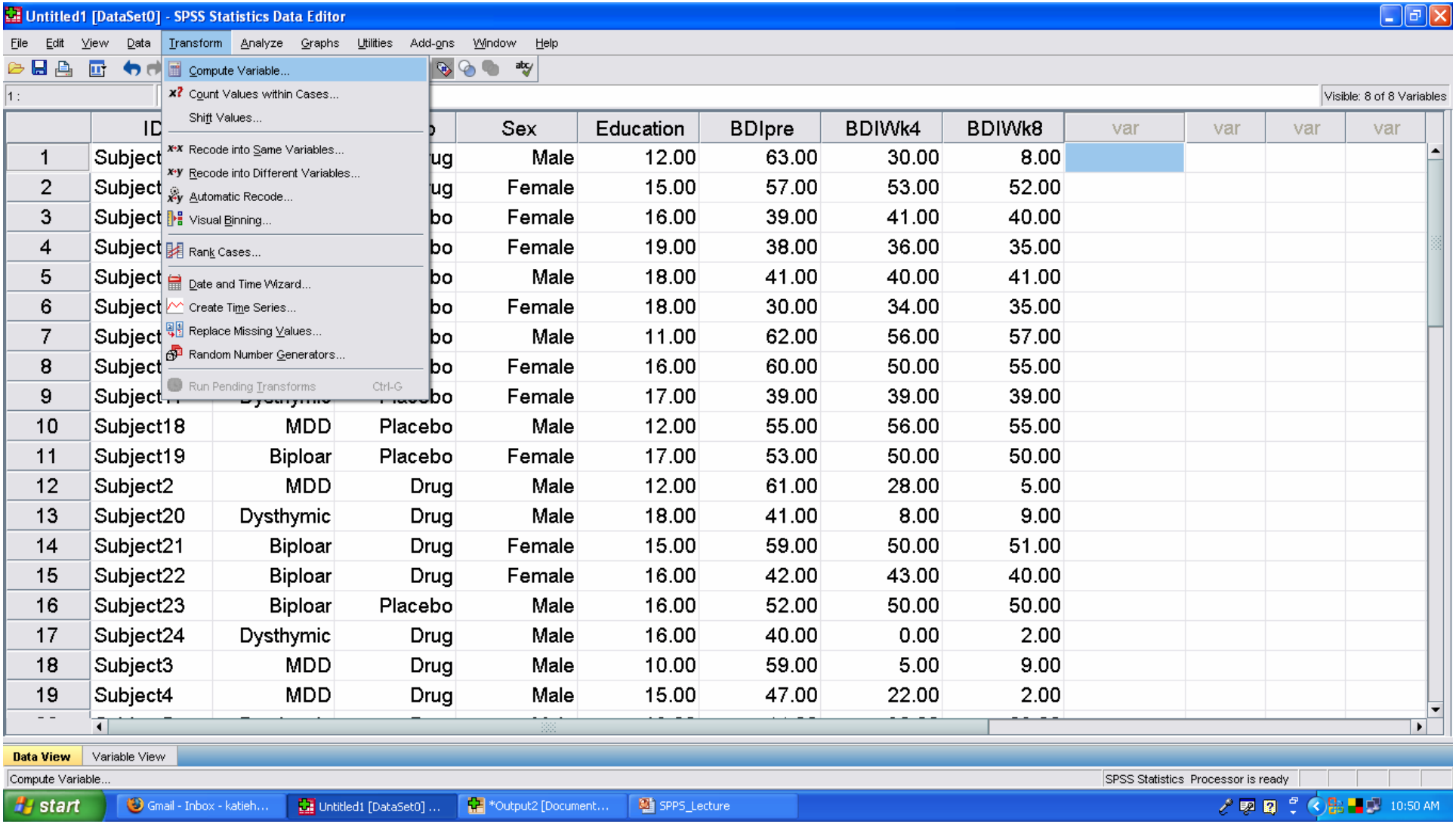


	ID	Dx	TxGroup				DIVVk8	var	var	var	var
1	Subject1	MDD	Drug				8.00				
2	Subject10	Biploar	Drug				52.00				
3	Subject11	Biploar	Placebo				40.00				
4	Subject12	Dysthymic	Placebo				35.00				
5	Subject13	Dysthymic	Placebo				41.00				
6	Subject14	Dysthymic	Placebo				35.00				
7	Subject15	Biploar	Placebo				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	2.00			

Computing New Variables

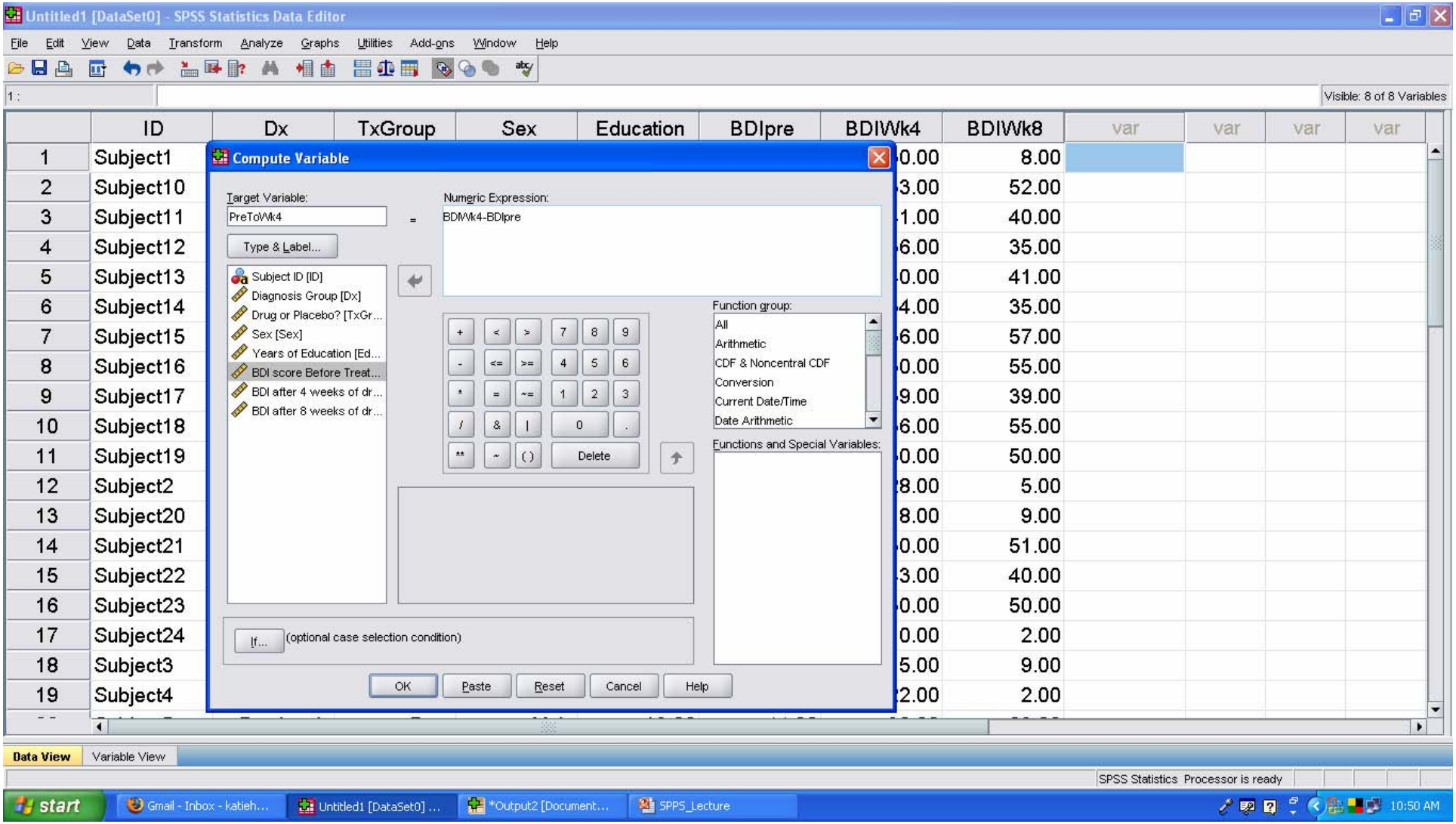
- I have BDI Scores at Pre, Week 4, and Week 8
- What if I want to have a new column that gives me the change from:
  - Pre to Week 4?
  - Pre to Week 8?

Computing New Variables

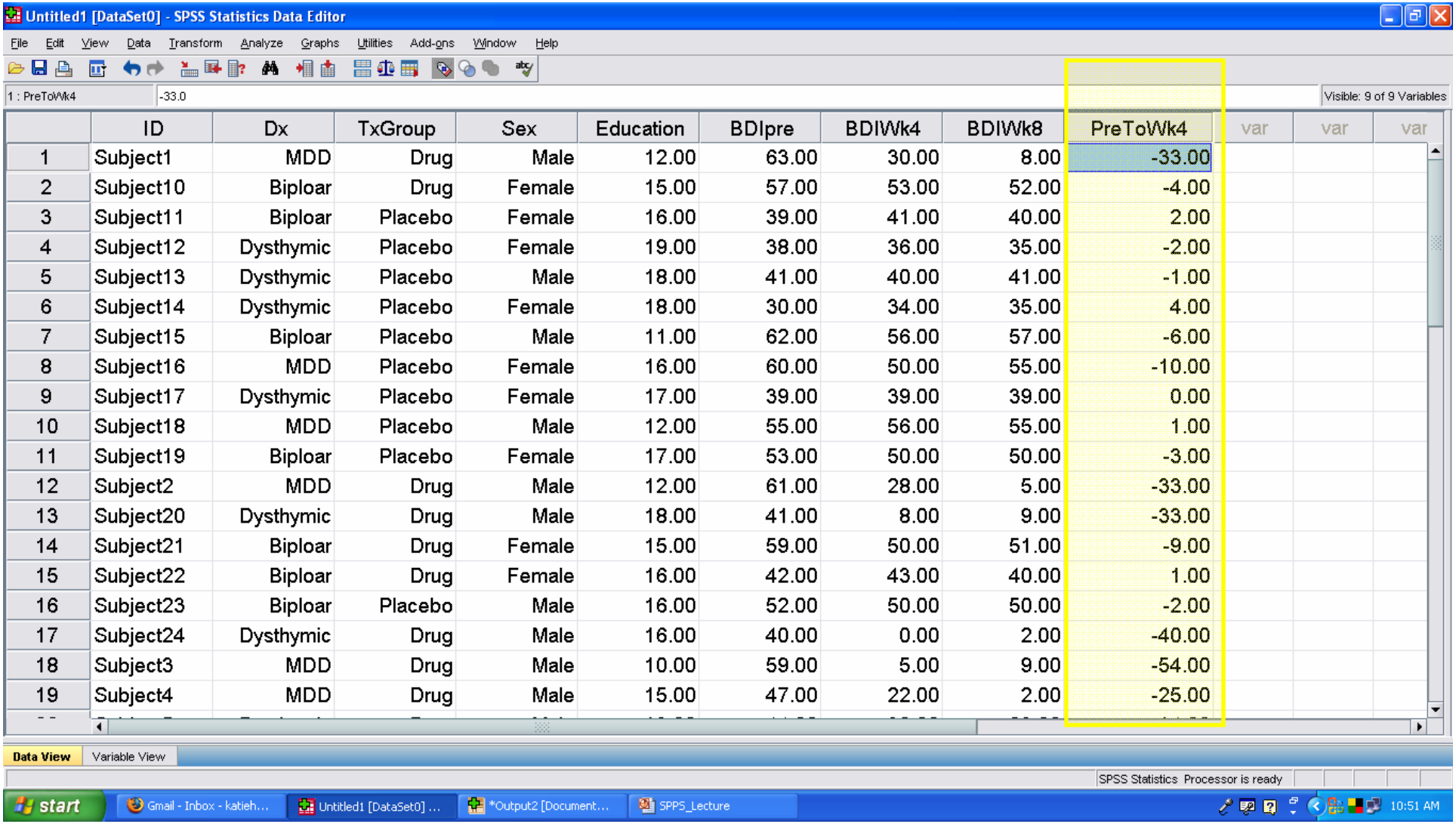


	ID			Sex	Education	BDIpre	BDIWk4	BDIWk8	var	var	var	var
1	Subject		ug	Male	12.00	63.00	30.00	8.00				
2	Subject		ug	Female	15.00	57.00	53.00	52.00				
3	Subject		bo	Female	16.00	39.00	41.00	40.00				
4	Subject		bo	Female	19.00	38.00	36.00	35.00				
5	Subject		bo	Male	18.00	41.00	40.00	41.00				
6	Subject		bo	Female	18.00	30.00	34.00	35.00				
7	Subject		bo	Male	11.00	62.00	56.00	57.00				
8	Subject		bo	Female	16.00	60.00	50.00	55.00				
9	Subject		bo	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				

Computing New Variables

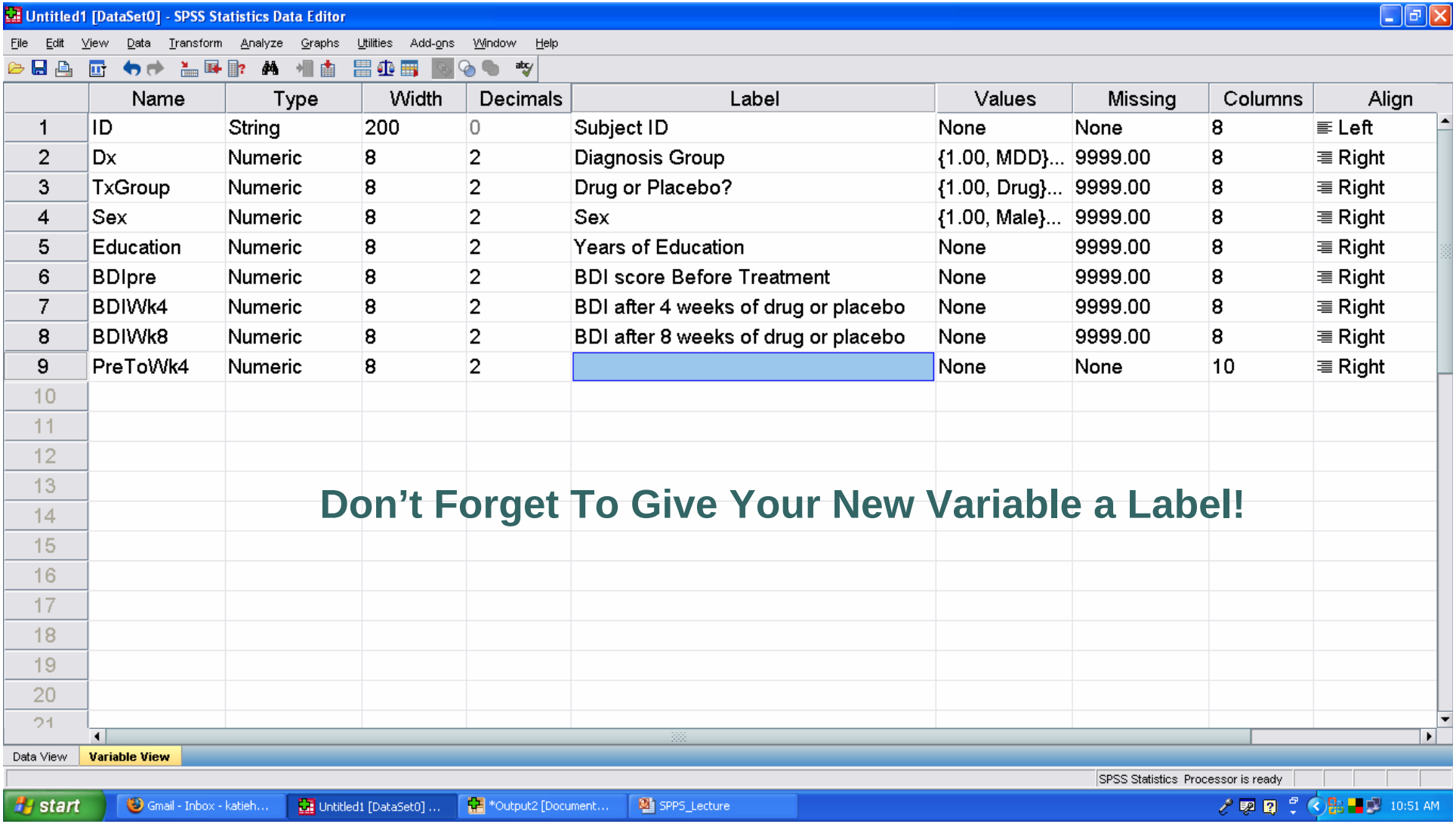


Computing New Variables



	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			

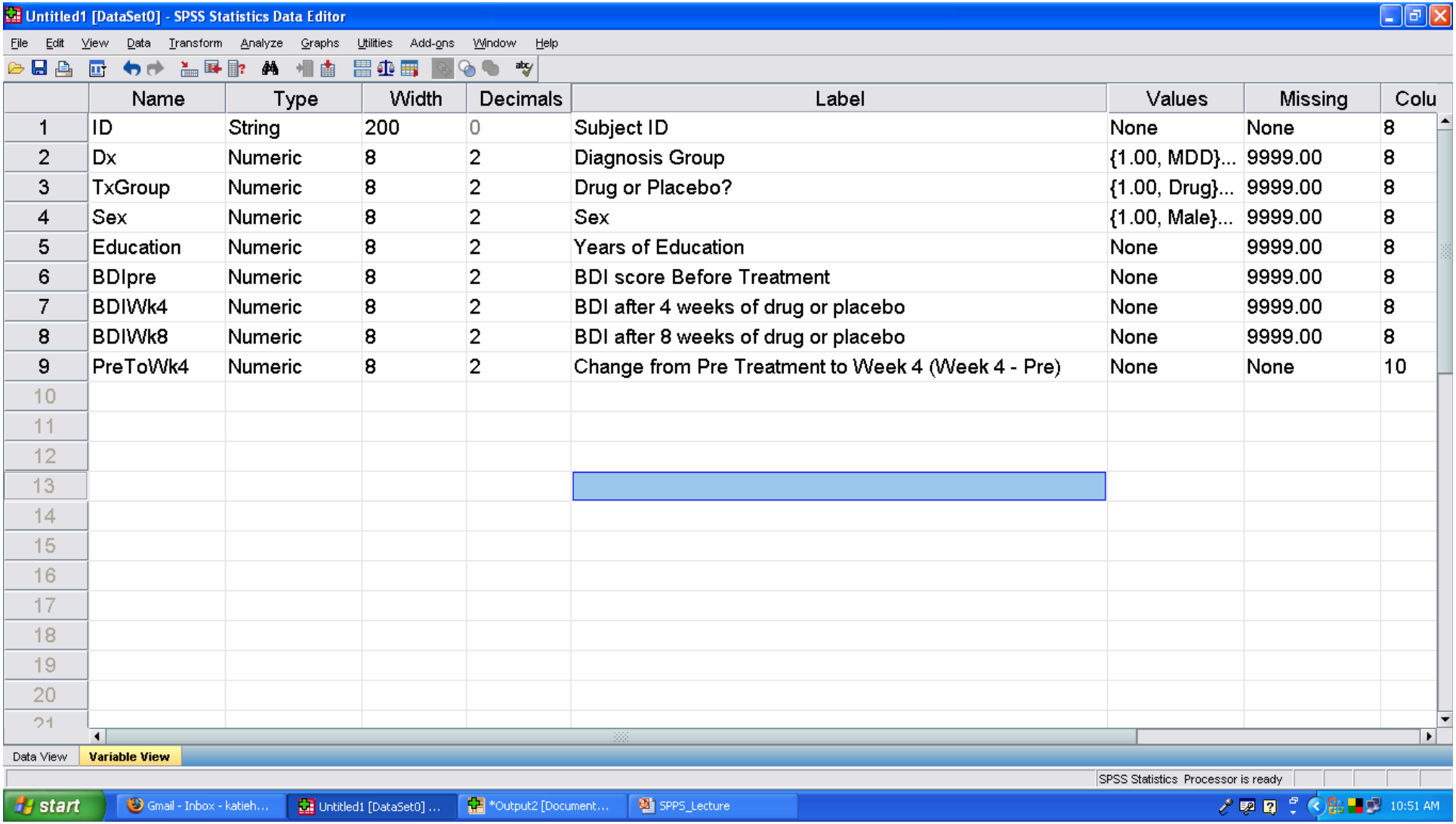
Computing New Variables



	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									

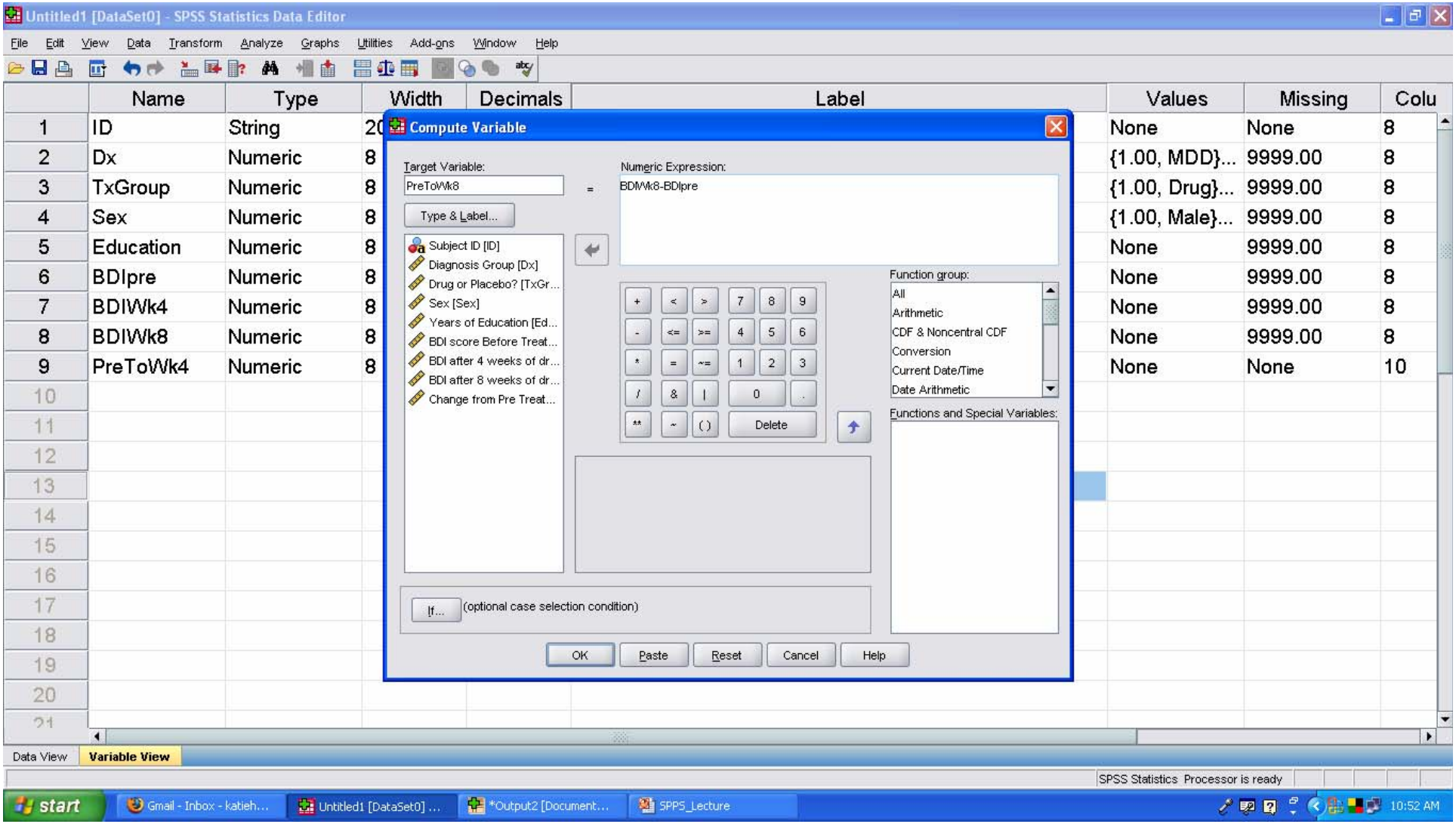
Don’t Forget To Give Your New Variable a Label!

Computing New Variables

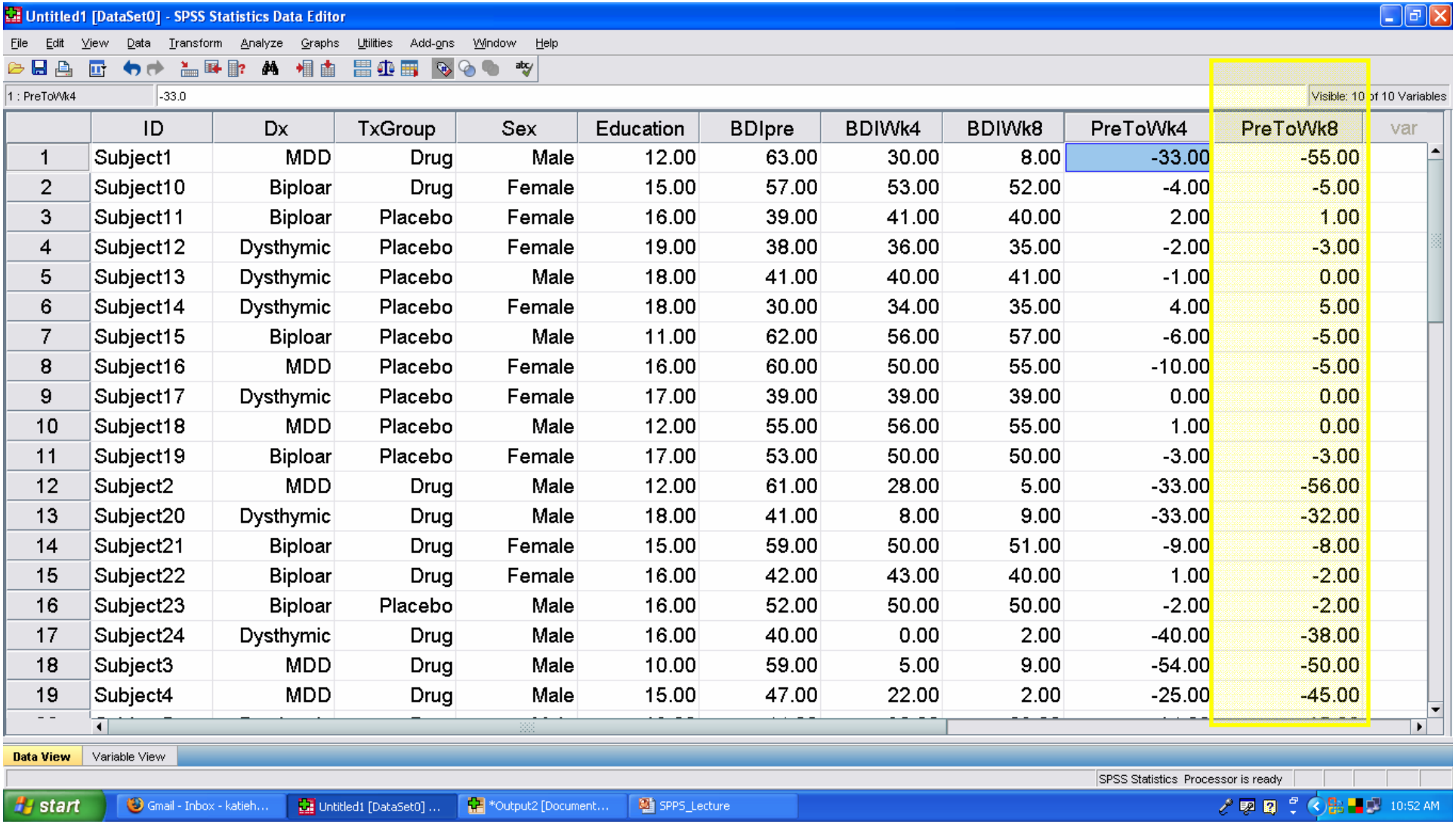


	Name	Type	Width	Decimals	Label	Values	Missing	Colu
1	ID	String	200	0	Subject ID	None	None	8
2	Dx	Numeric	8	2	Diagnosis Group	{1.00, MDD}...	9999.00	8
3	TxGroup	Numeric	8	2	Drug or Placebo?	{1.00, Drug}...	9999.00	8
4	Sex	Numeric	8	2	Sex	{1.00, Male}...	9999.00	8
5	Education	Numeric	8	2	Years of Education	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								

Computing New Variables



Computing New 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	

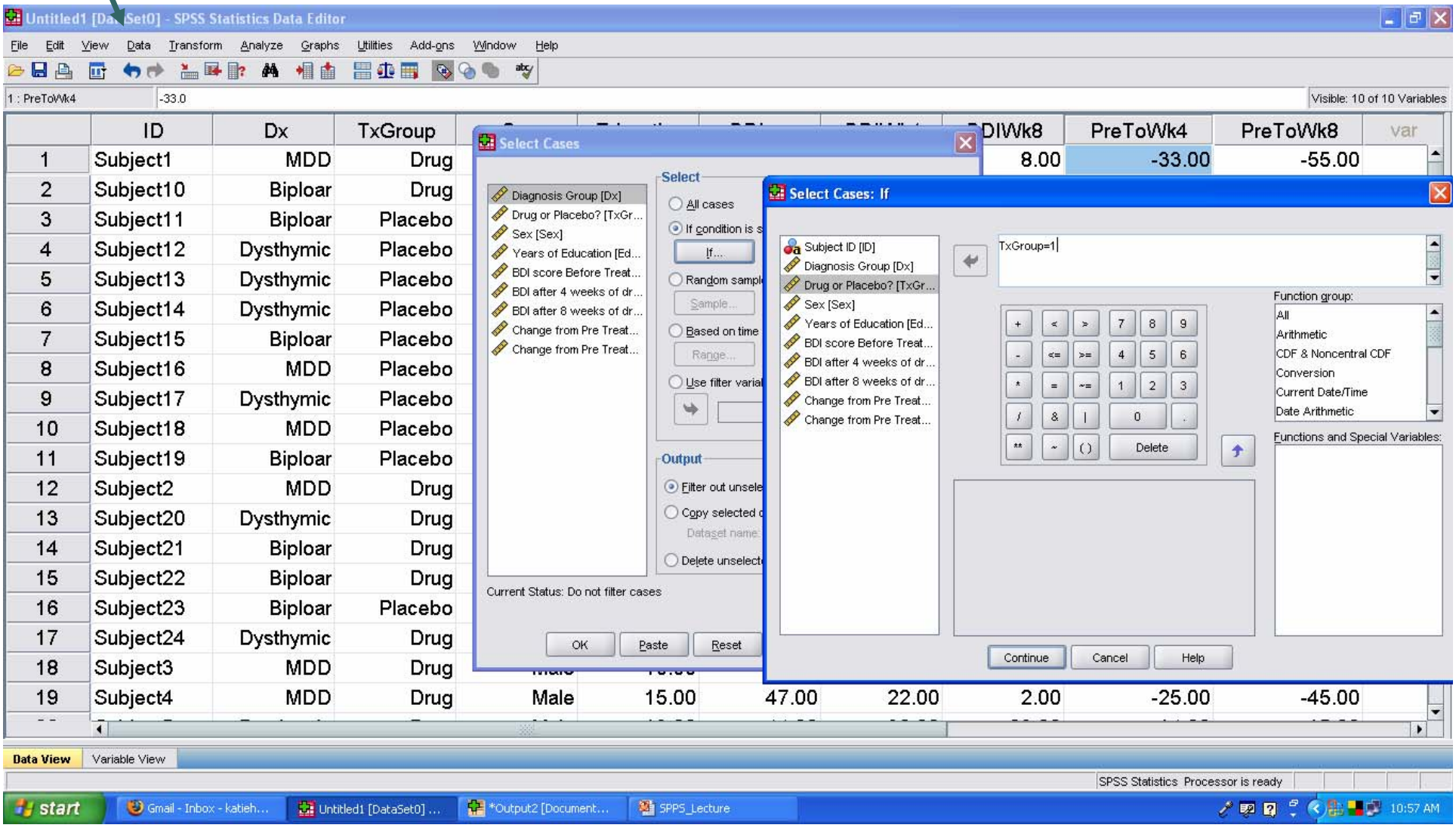
T-Tests

- 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

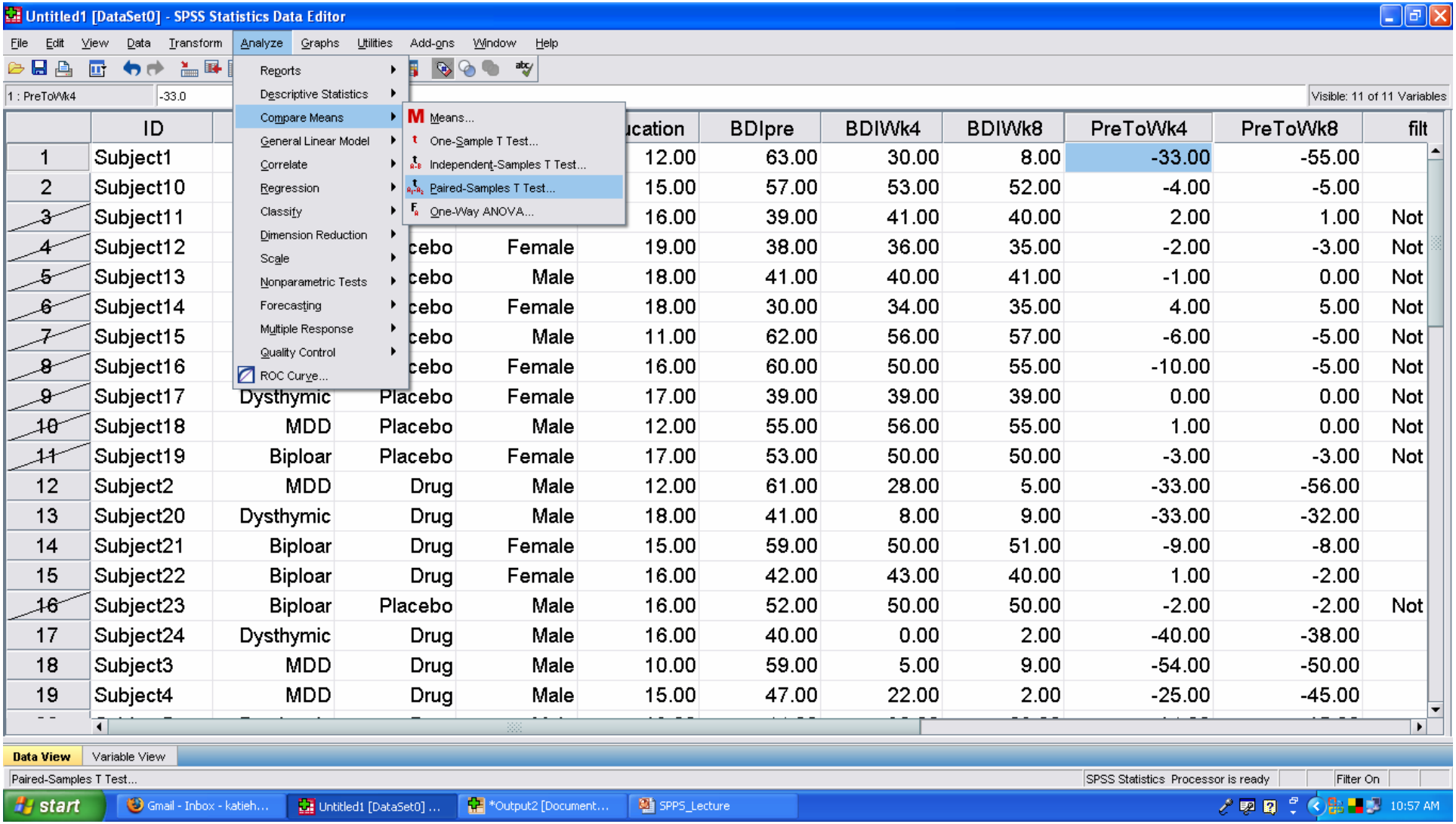
Paired T-Tests

- 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

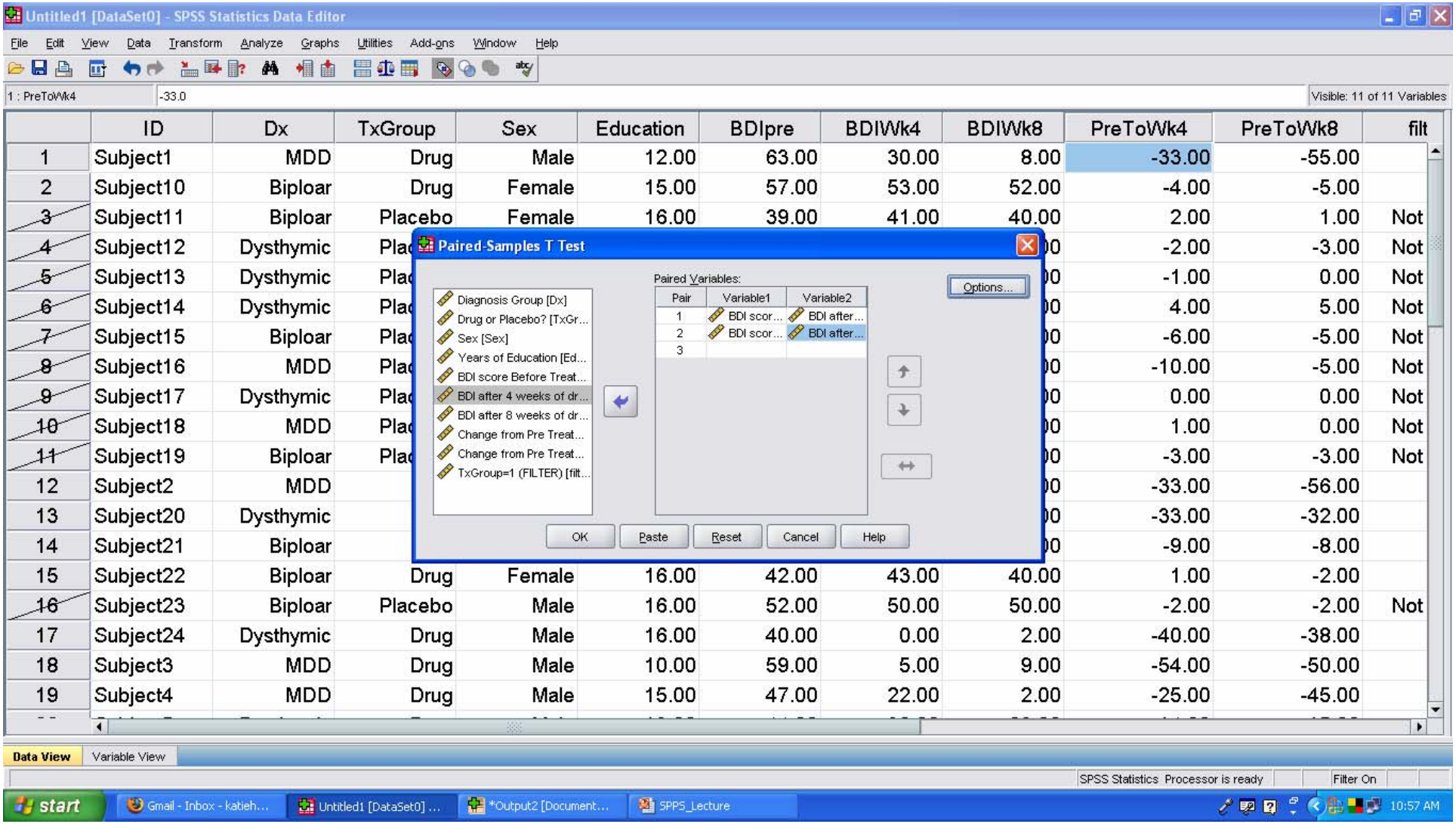
Selecting Cases



Paired-Samples T-Test

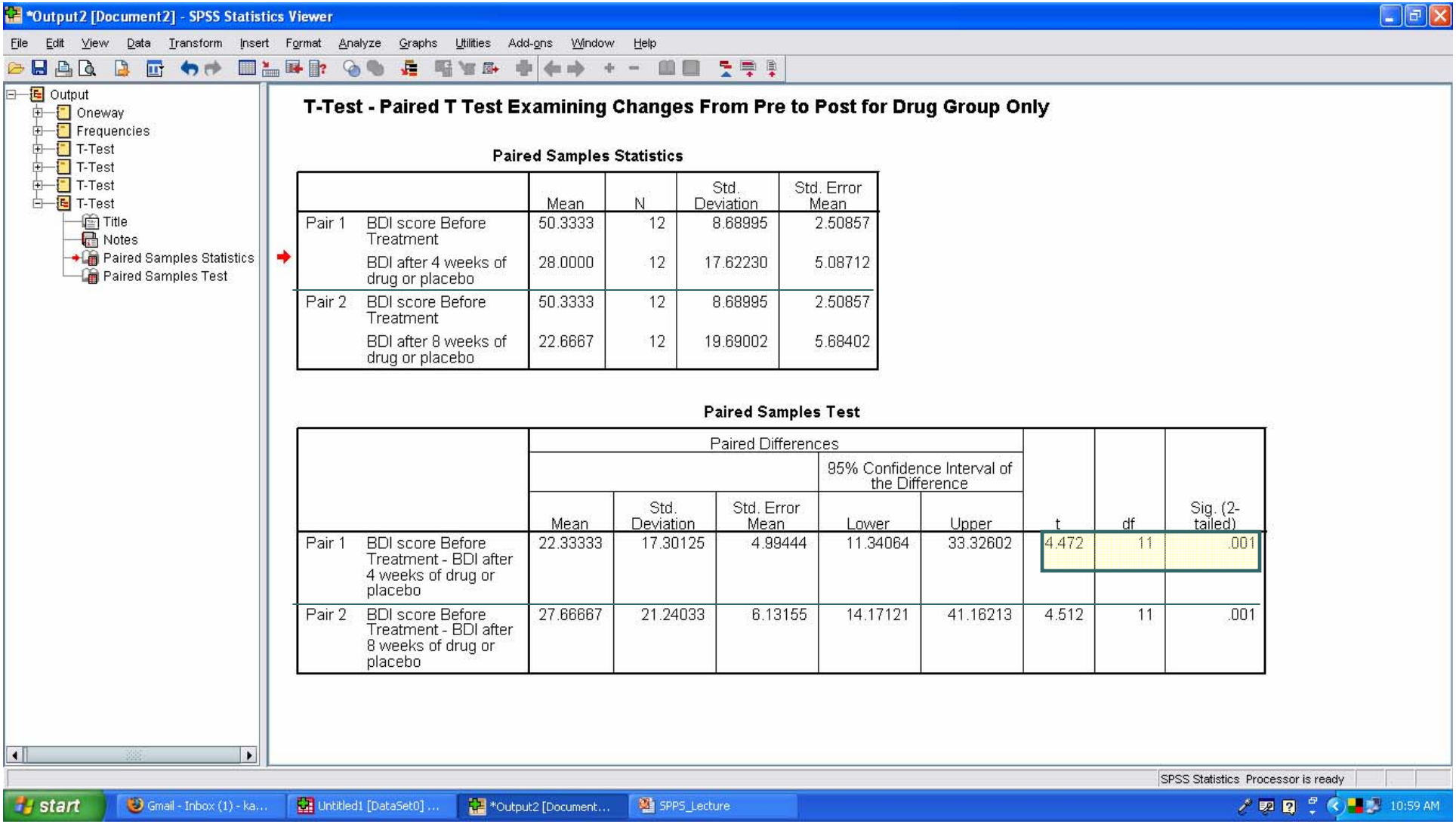


Paired-Samples T-Test



	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	Plac					00	-2.00	-3.00	Not
5	Subject13	Dysthymic	Plac					00	-1.00	0.00	Not
6	Subject14	Dysthymic	Plac					00	4.00	5.00	Not
7	Subject15	Biploar	Plac					00	-6.00	-5.00	Not
8	Subject16	MDD	Plac					00	-10.00	-5.00	Not
9	Subject17	Dysthymic	Plac					00	0.00	0.00	Not
10	Subject18	MDD	Plac					00	1.00	0.00	Not
11	Subject19	Biploar	Plac					00	-3.00	-3.00	Not
12	Subject2	MDD						00	-33.00	-56.00	
13	Subject20	Dysthymic						00	-33.00	-32.00	
14	Subject21	Biploar						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	

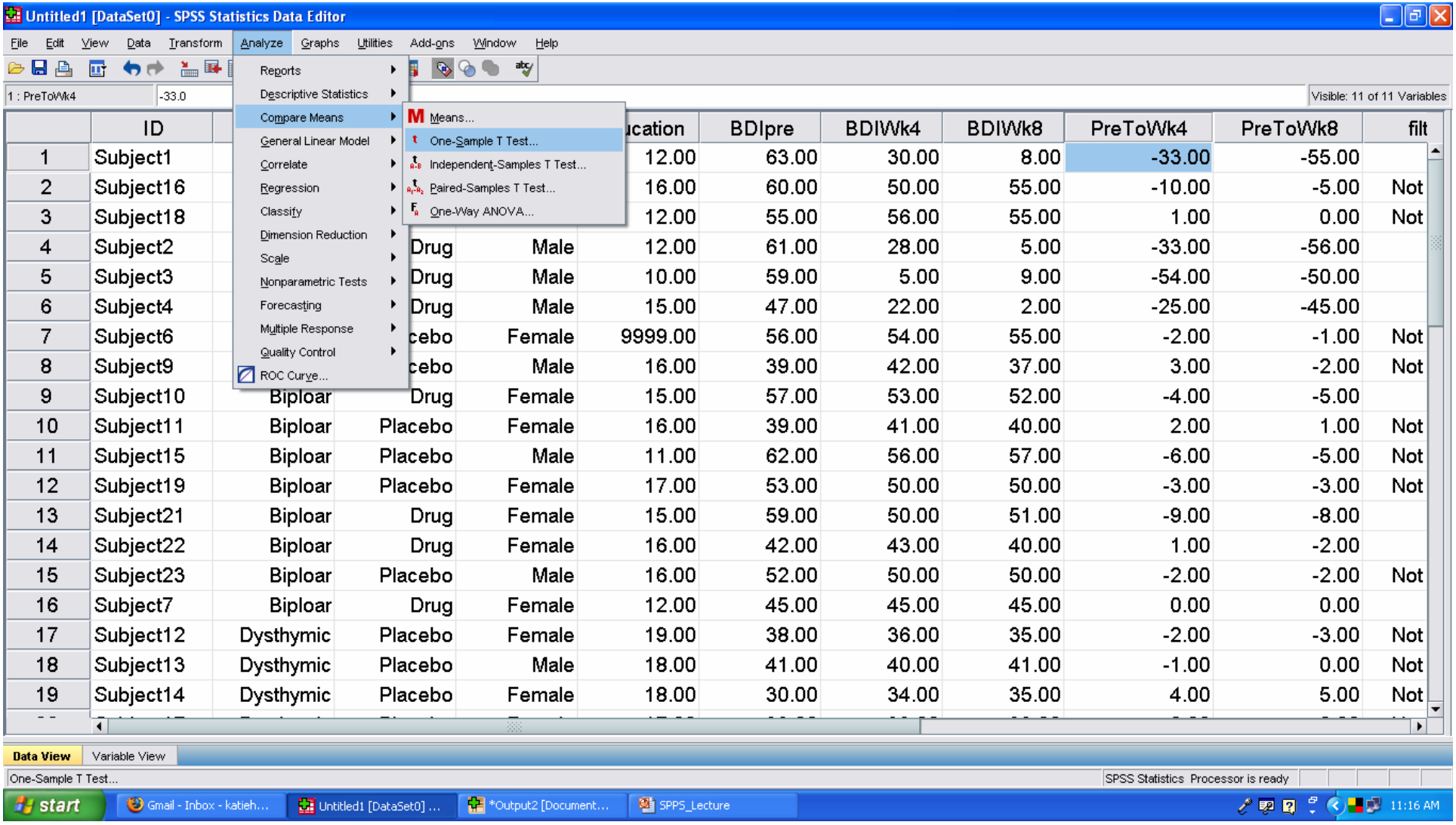
Paired-Samples T-Test



One-Sample T-Test

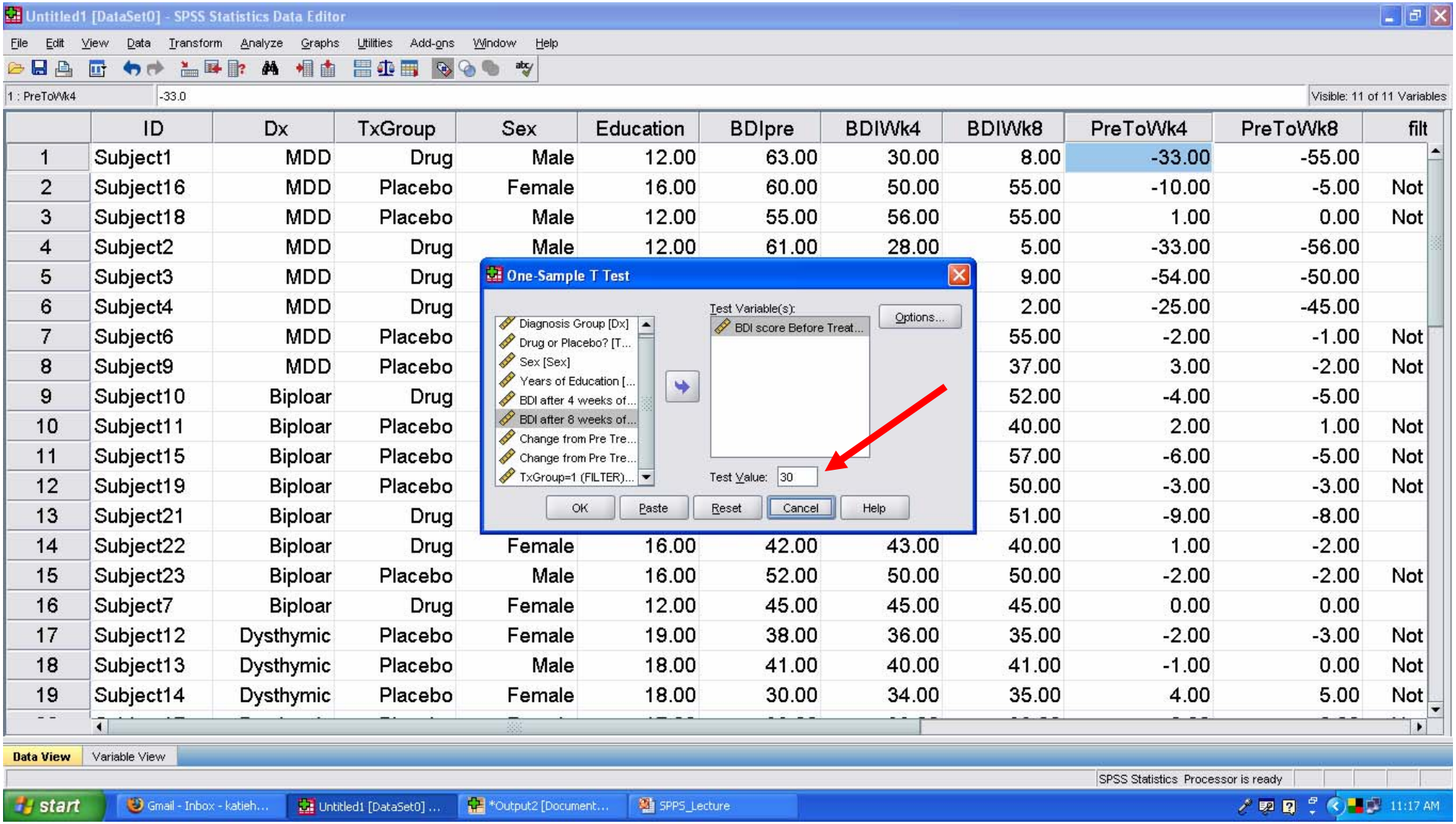
- Question:
  - Does our sample as a whole at pre have BDI scores significantly different from what clinicians deem to be the cutoff for *severe* depression (BDI=30)?

One-Sample T-Test



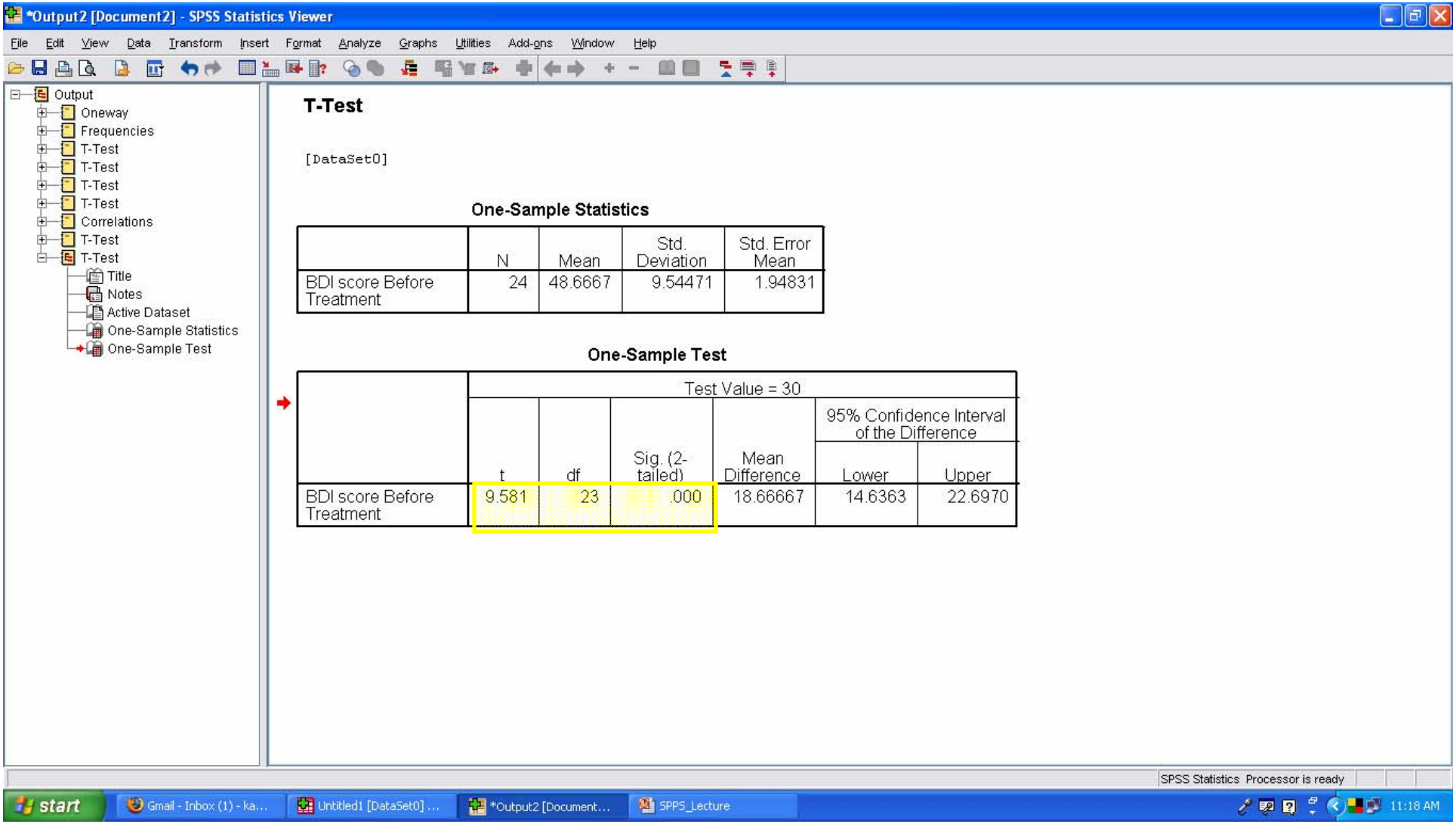
	ID				ucation	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1				12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject16				16.00	60.00	50.00	55.00	-10.00	-5.00	Not
3	Subject18				12.00	55.00	56.00	55.00	1.00	0.00	Not
4	Subject2		Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
5	Subject3		Drug	Male	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



	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

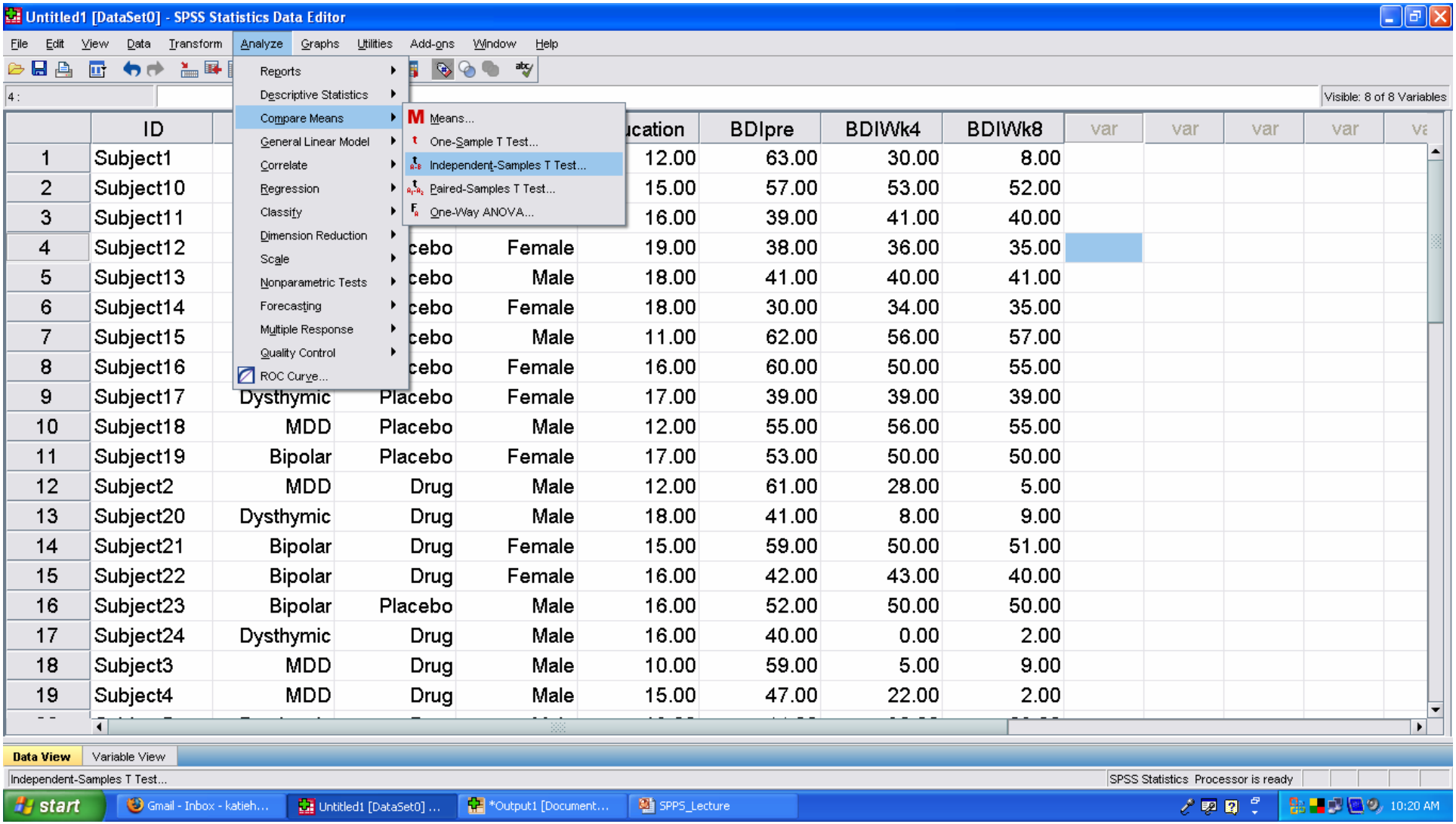
One-Sample T-Test



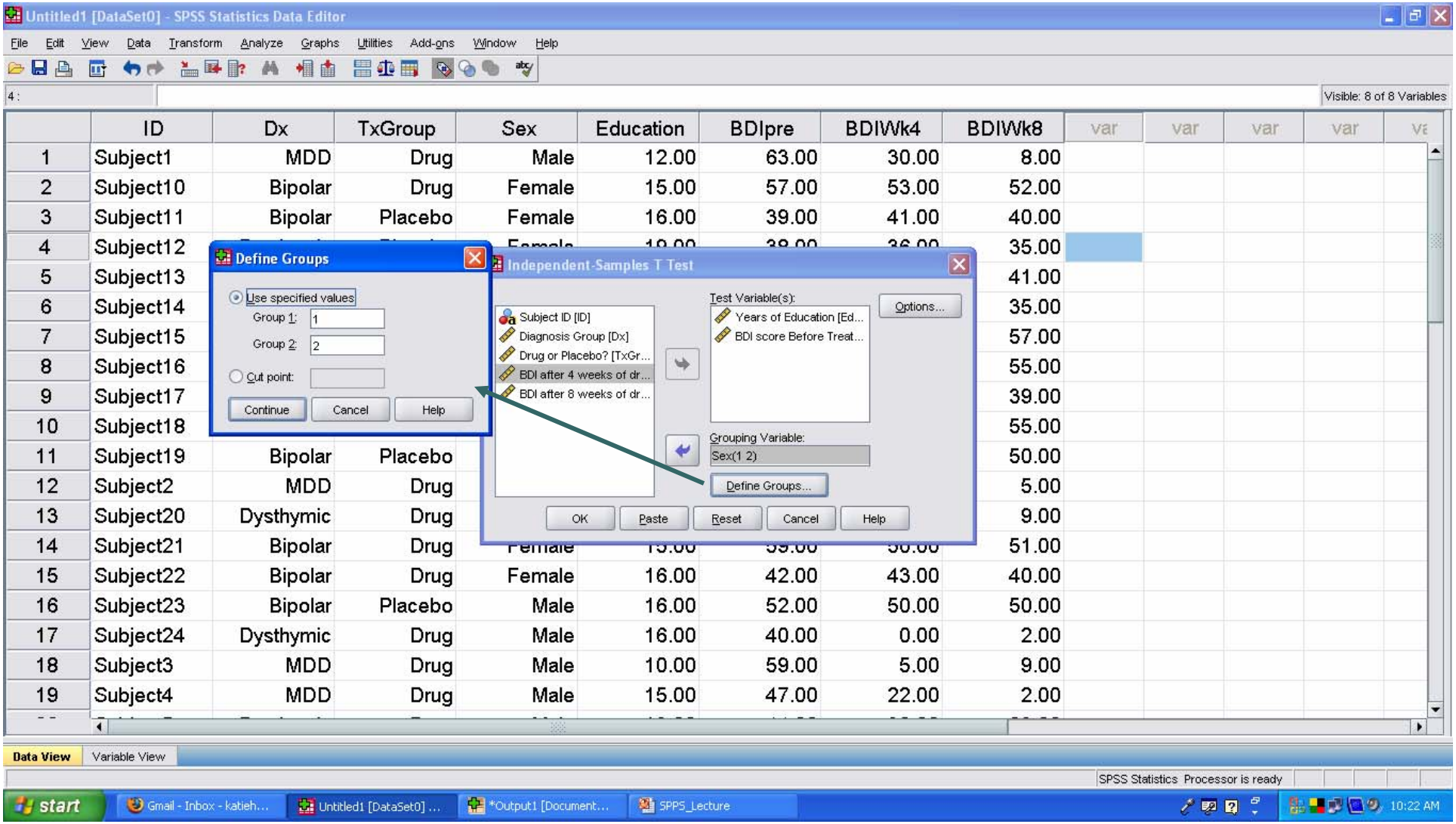
Independent Samples T-Test

- Do two groups different 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

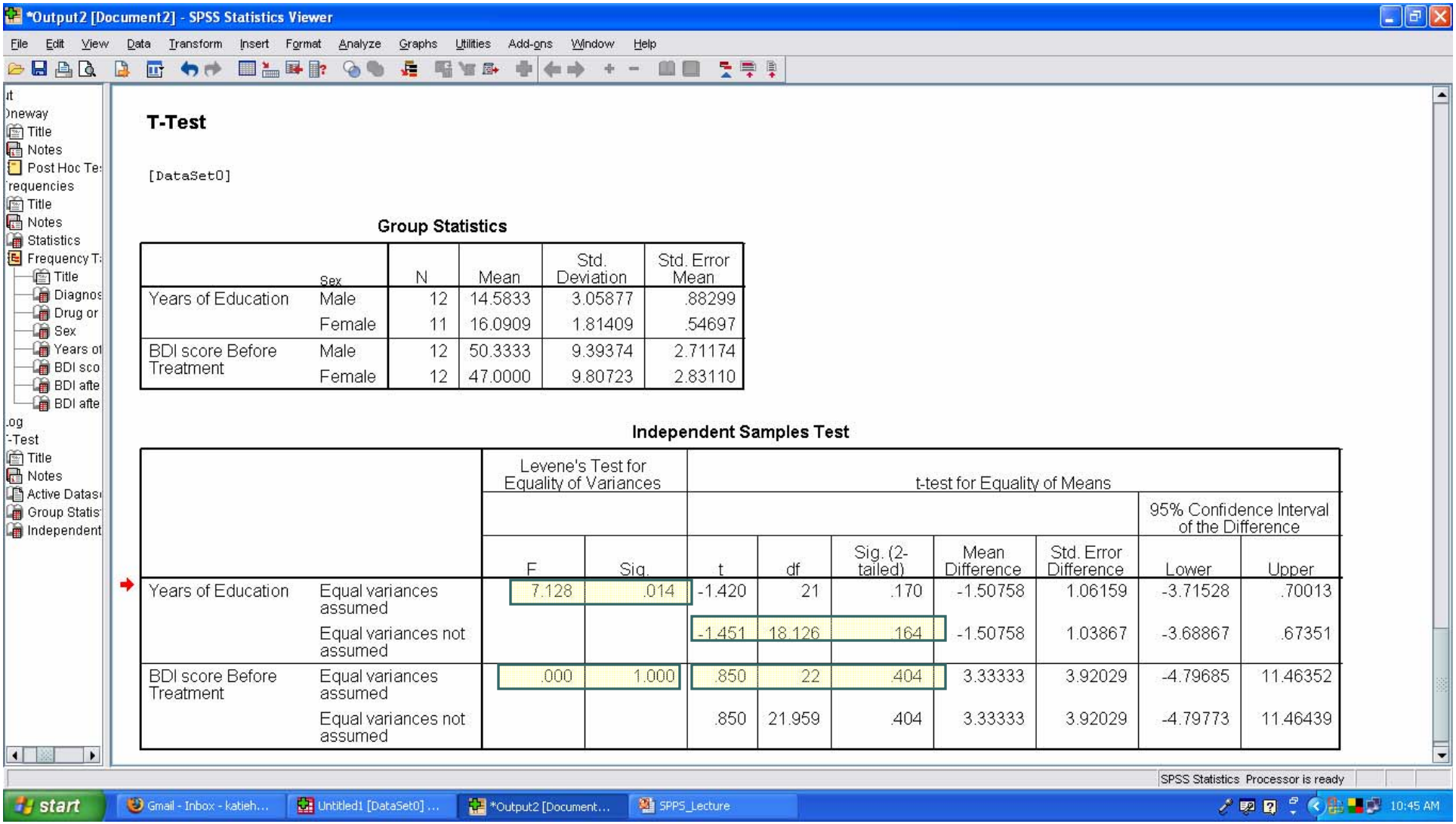
Independent-Sample T-Test



Independent-Sample T-Test



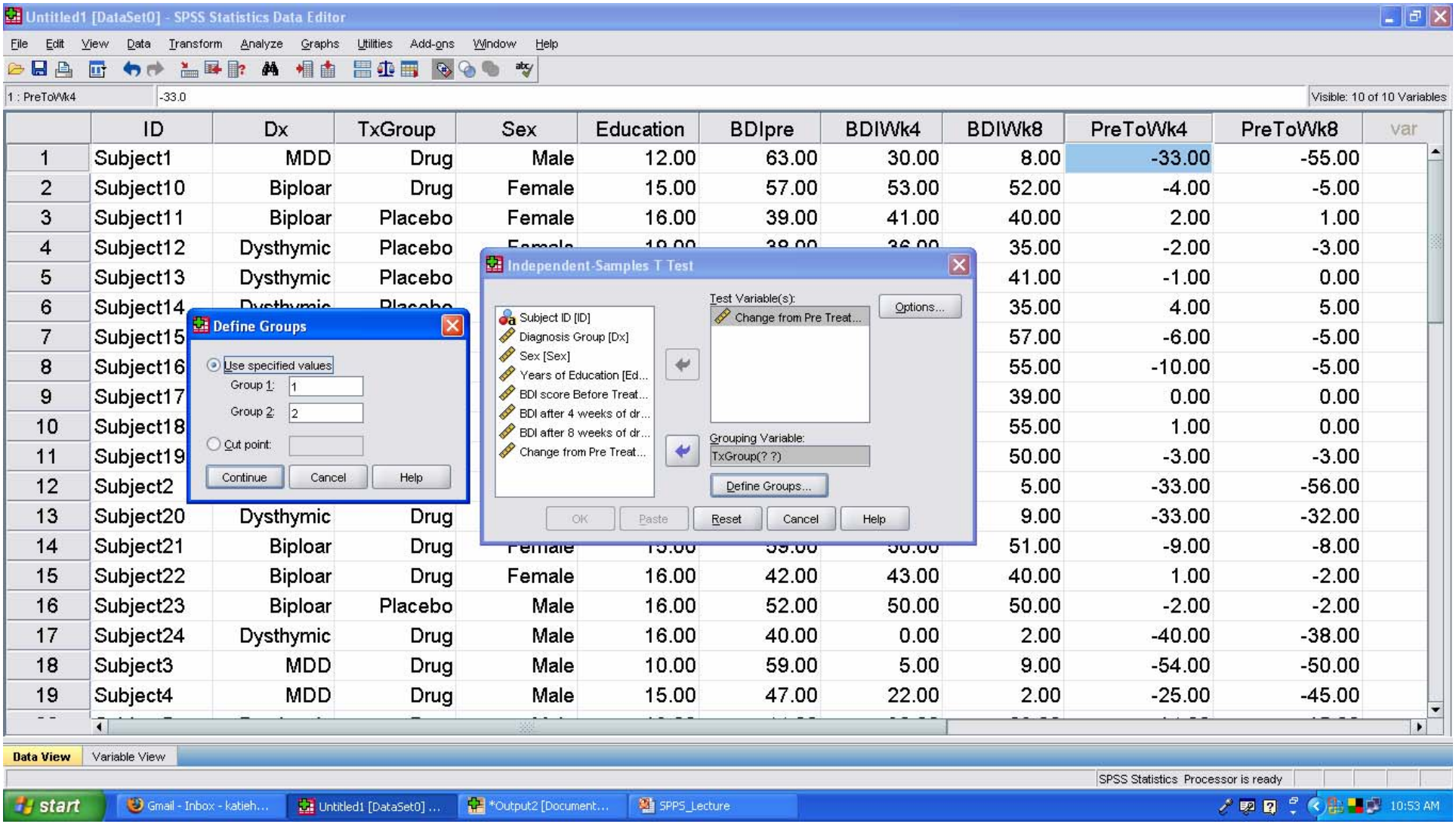
Independent-Sample T-Test



Independent Samples T-Test

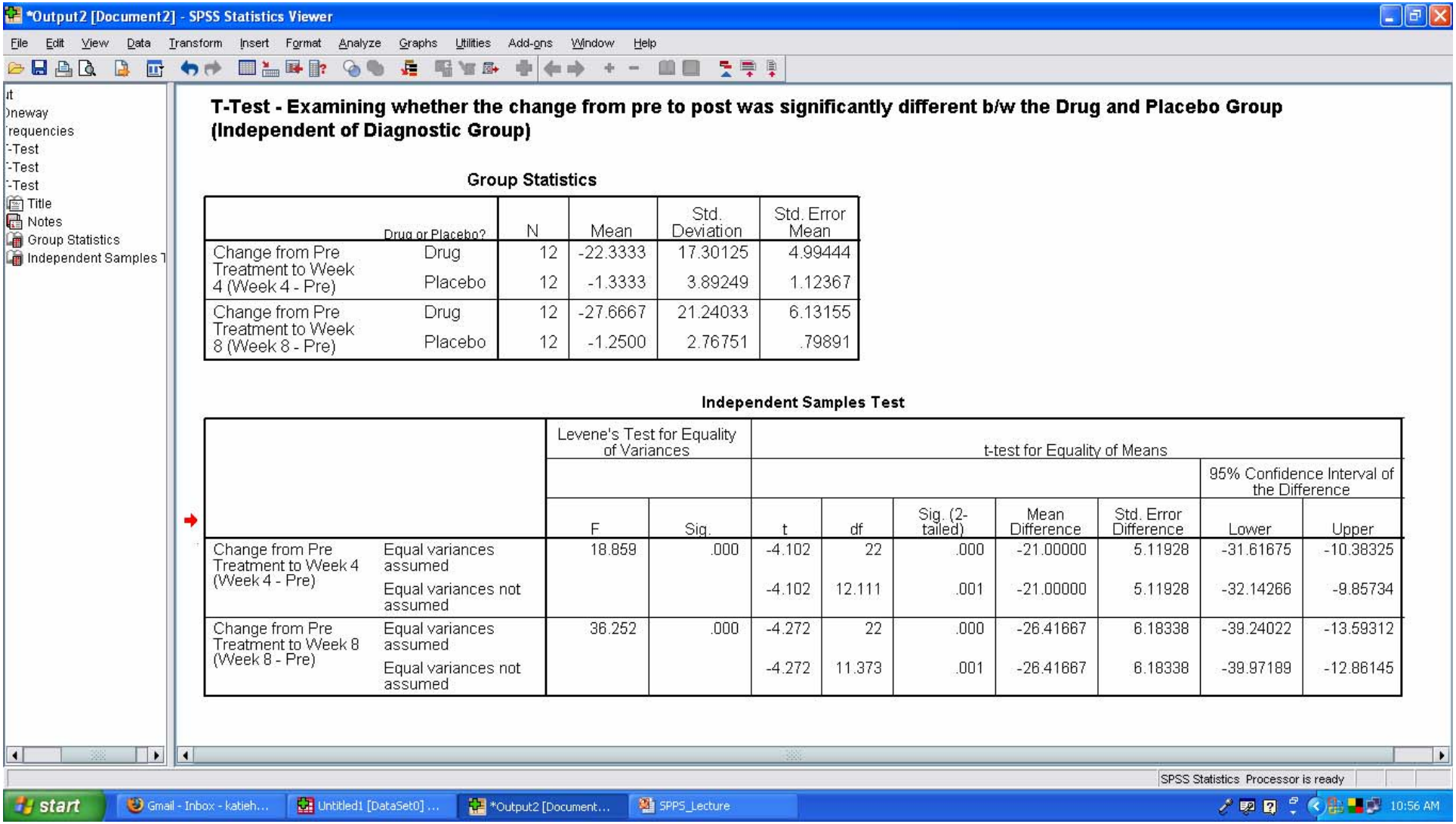
- Is there a significant difference in the BDI *change score* from Pre to Week 4 between those who received the drug and those who were in the placebo group?
  - IV = Treatment Group (drug vs placebo)
  - DV = BDI Change Score

Independent-Sample T-Test



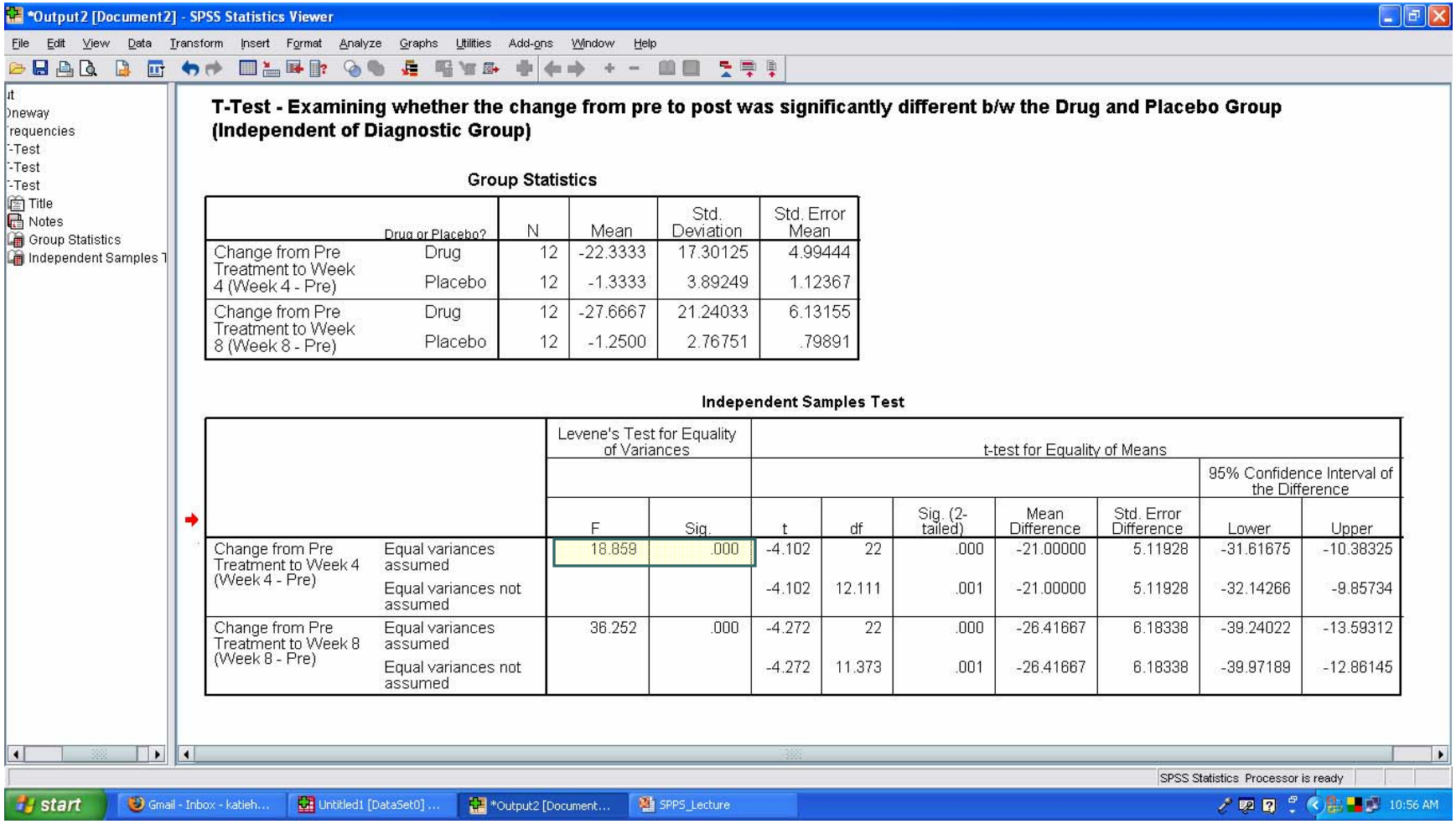
	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	var
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
3	Subject11	Biploar	Placebo	Female	16.00	39.00	41.00	40.00	2.00	1.00	
4	Subject12	Dysthymic	Placebo					35.00	-2.00	-3.00	
5	Subject13	Dysthymic	Placebo					41.00	-1.00	0.00	
6	Subject14							35.00	4.00	5.00	
7	Subject15							57.00	-6.00	-5.00	
8	Subject16							55.00	-10.00	-5.00	
9	Subject17							39.00	0.00	0.00	
10	Subject18							55.00	1.00	0.00	
11	Subject19							50.00	-3.00	-3.00	
12	Subject2							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	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	

Independent-Sample T-Test



Levene's Test:

homogeneity of variance



*Output2 [Document2] - SPSS Statistics Viewer

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

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- Title
- Notes
- Group Statistics
- Independent Samples T

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

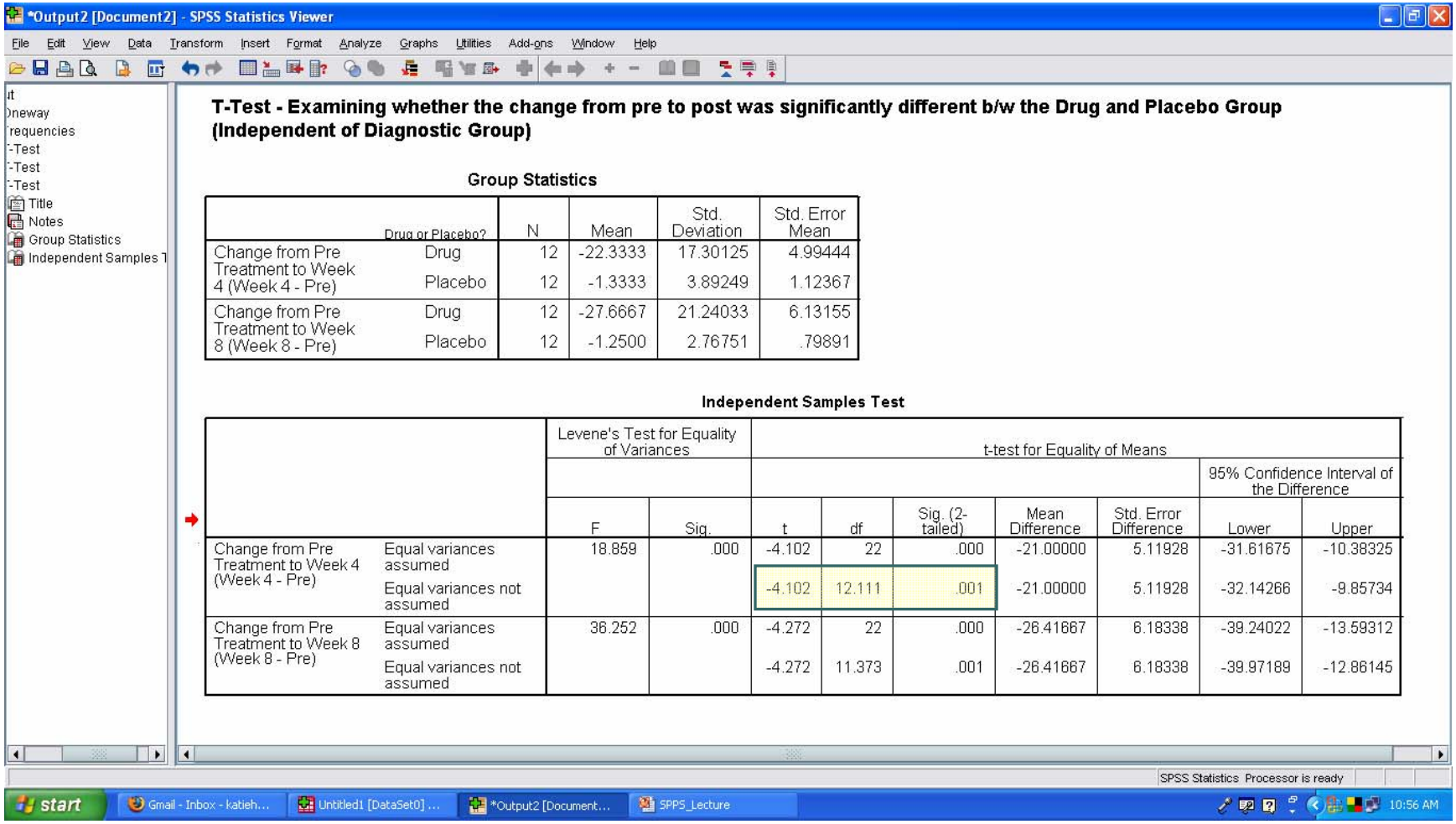
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Equal variances assumed	18.859	.000	-4.102	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 [Document... | SPPS_Lecture | 10:56 AM

Levene's Test:

homogeneity of variance



*Output2 [Document2] - SPSS Statistics Viewer

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

- Oneway
- Frequencies
- T-Test
- T-Test
- T-Test
- Title
- Notes
- Group Statistics
- Independent Samples T

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						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error 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

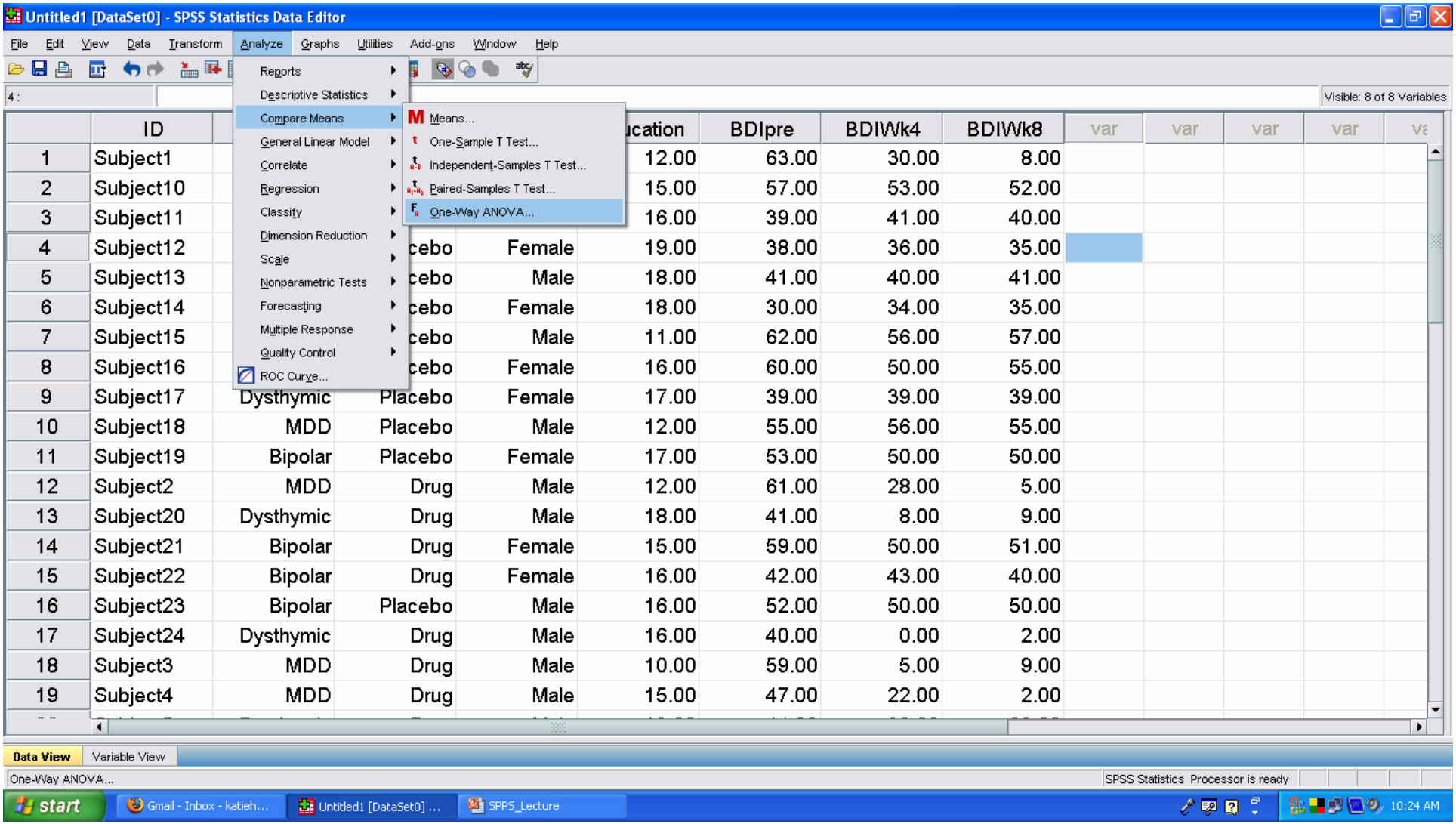
SPSS Statistics Processor is ready

start | Gmail - Inbox - katieh... | Untitled1 [DataSet0] ... | *Output2 [Document... | SPPS_Lecture | 10:56 AM

One-Way ANOVA

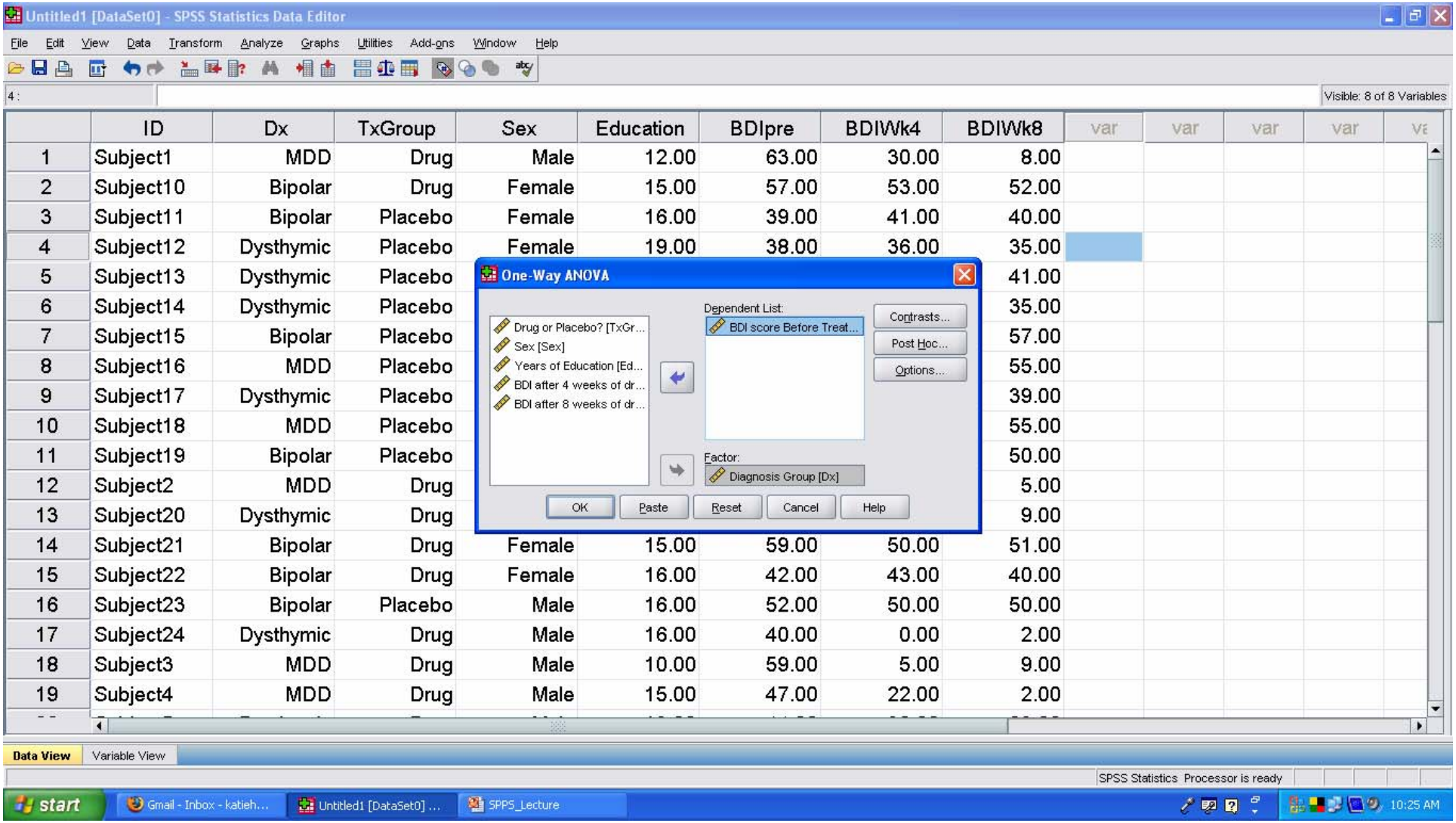
- IV = Categorical
- DV = Continuous
- Two *or more* groups
  - Note: An Ind-T-Test can only have 2 groups
- i.e. Did the three Diagnostic Groups Differ in Pre-Treatment BDI Scores?

One-Way ANOVA

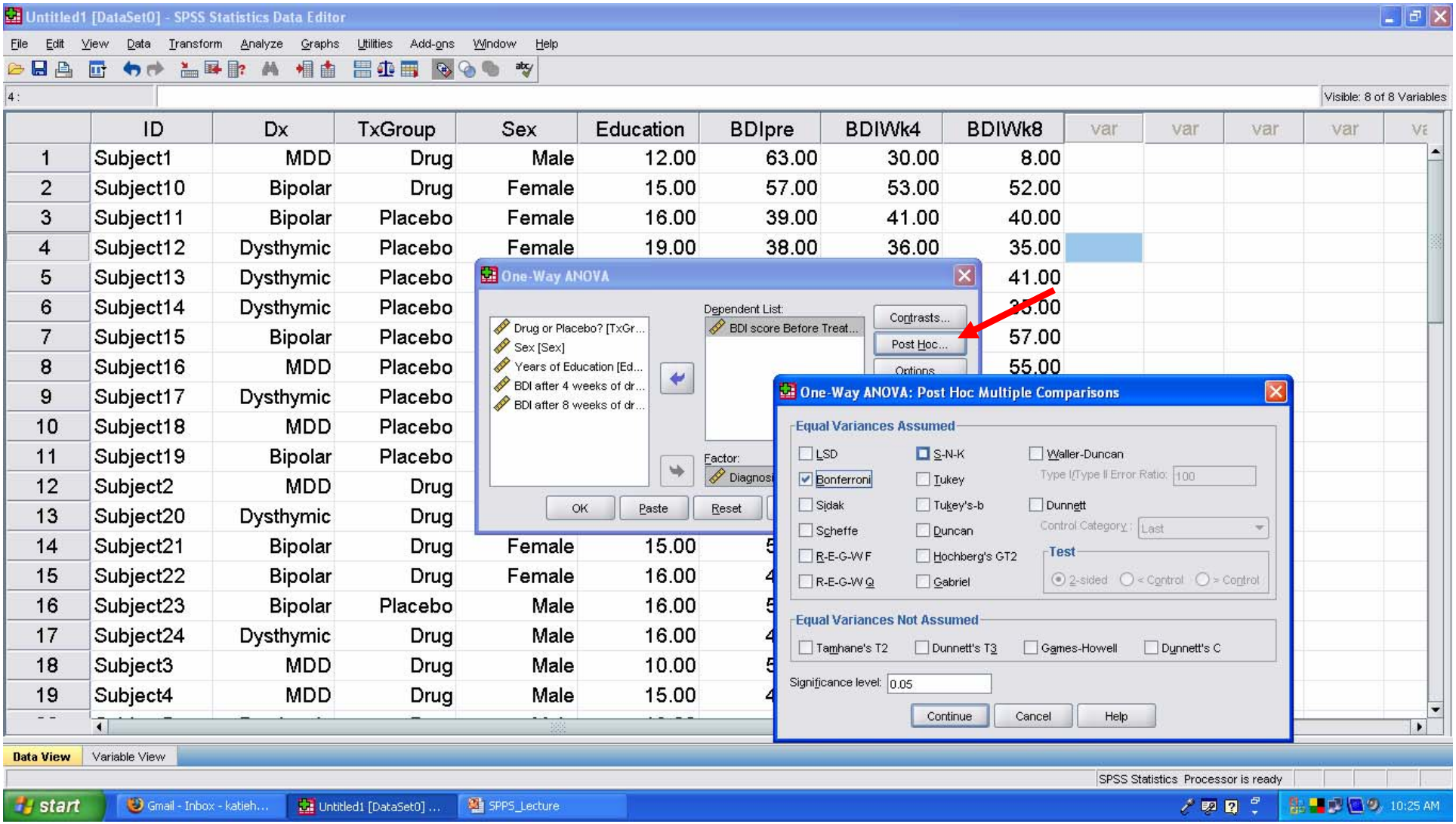


	ID				ucation	BDIpre	BDIWk4	BDIWk8	var	var	var	var	va
1	Subject1				12.00	63.00	30.00	8.00					
2	Subject10				15.00	57.00	53.00	52.00					
3	Subject11				16.00	39.00	41.00	40.00					
4	Subject12		cebo	Female	19.00	38.00	36.00	35.00					
5	Subject13		cebo	Male	18.00	41.00	40.00	41.00					
6	Subject14		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					

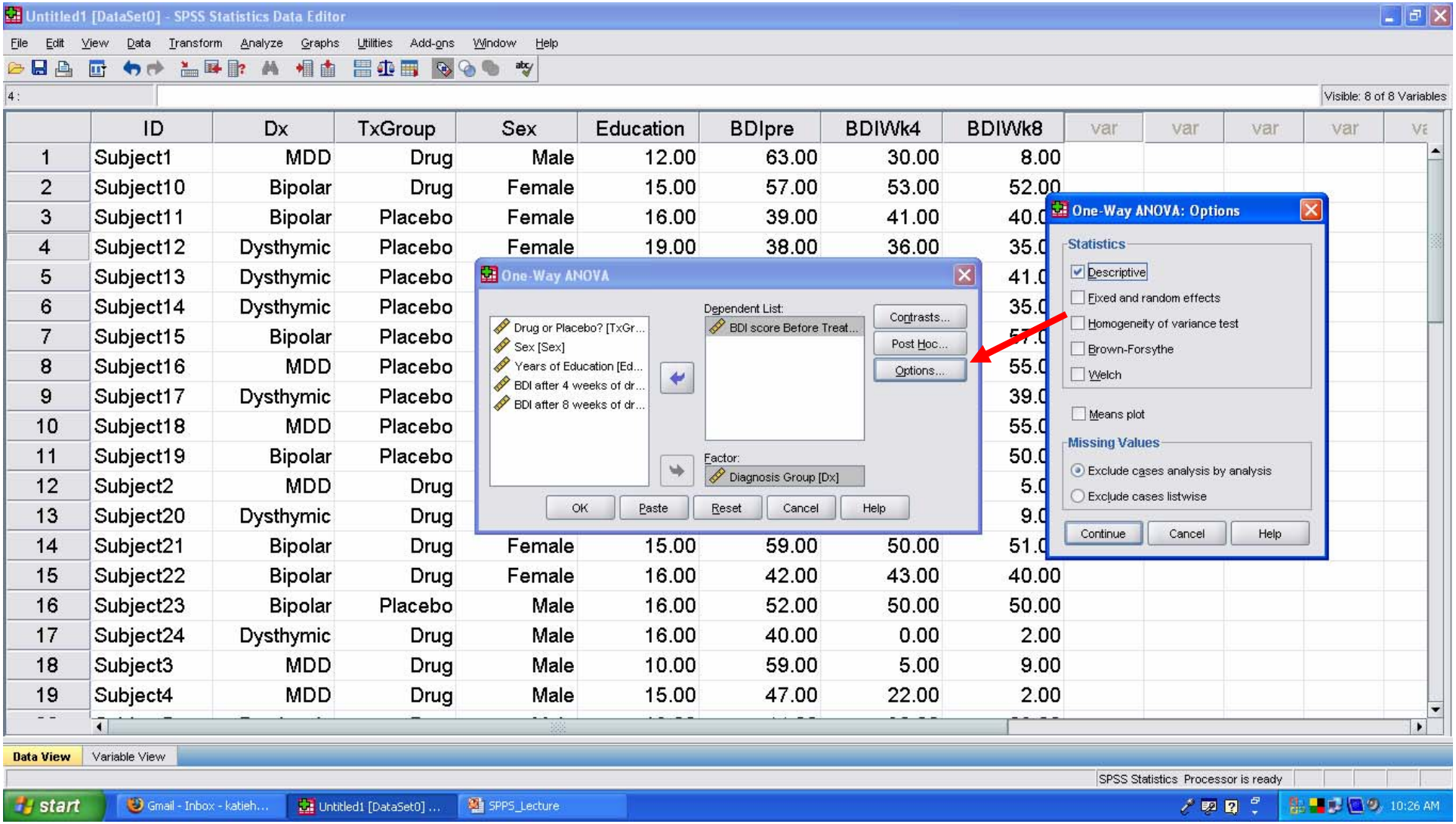
One-Way ANOVA



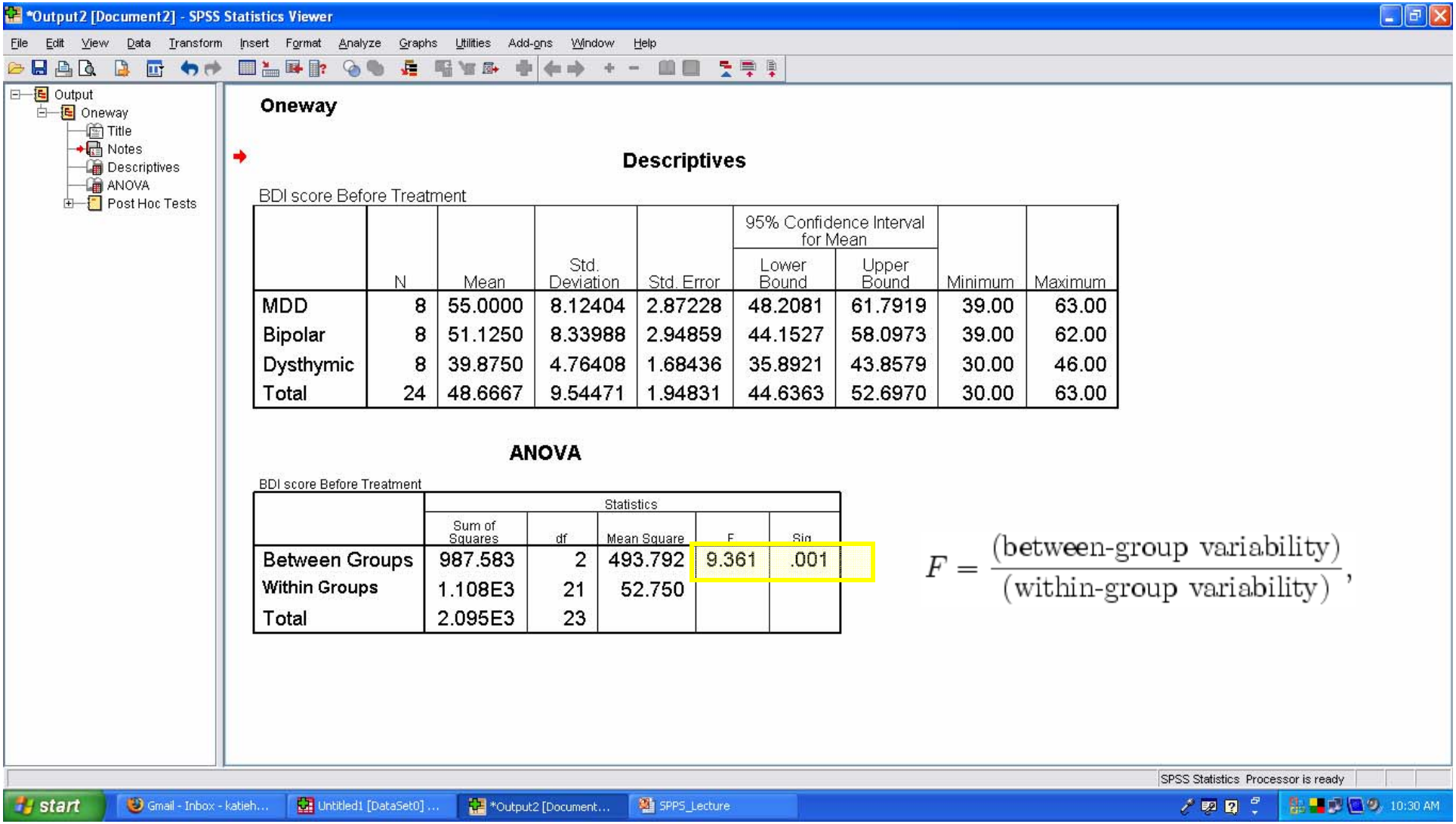
One-Way ANOVA



One-Way ANOVA



One-Way ANOVA



BDI score Before Treatment

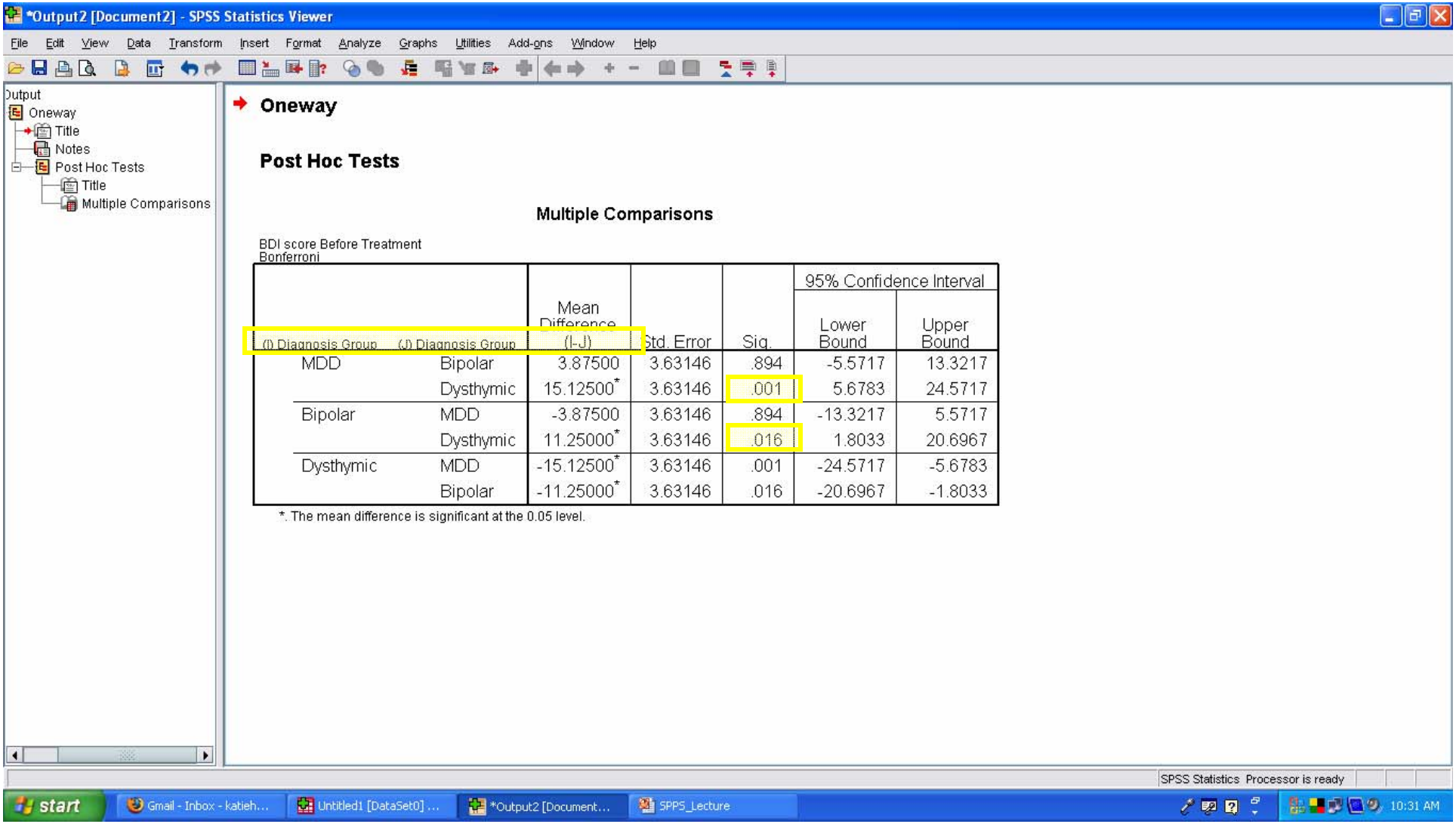
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
MDD	8	55.0000	8.12404	2.87228	48.2081	61.7919	39.00	63.00
Bipolar	8	51.1250	8.33988	2.94859	44.1527	58.0973	39.00	62.00
Dysthymic	8	39.8750	4.76408	1.68436	35.8921	43.8579	30.00	46.00
Total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

BDI score Before Treatment

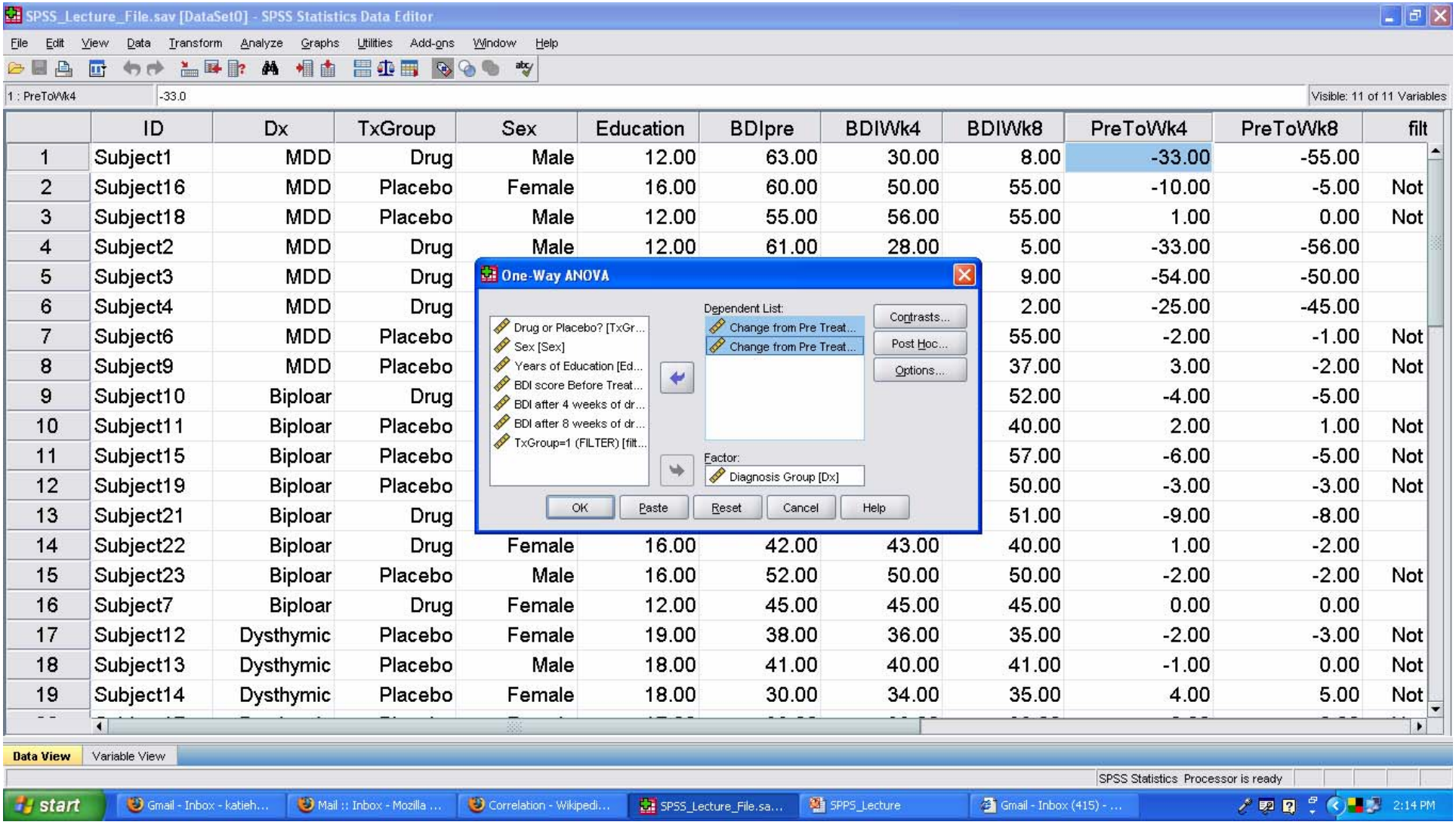
	Statistics				
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	987.583	2	493.792	9.361	.001
Within Groups	1.108E3	21	52.750		
Total	2.095E3	23			

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

Post Hoc Tests

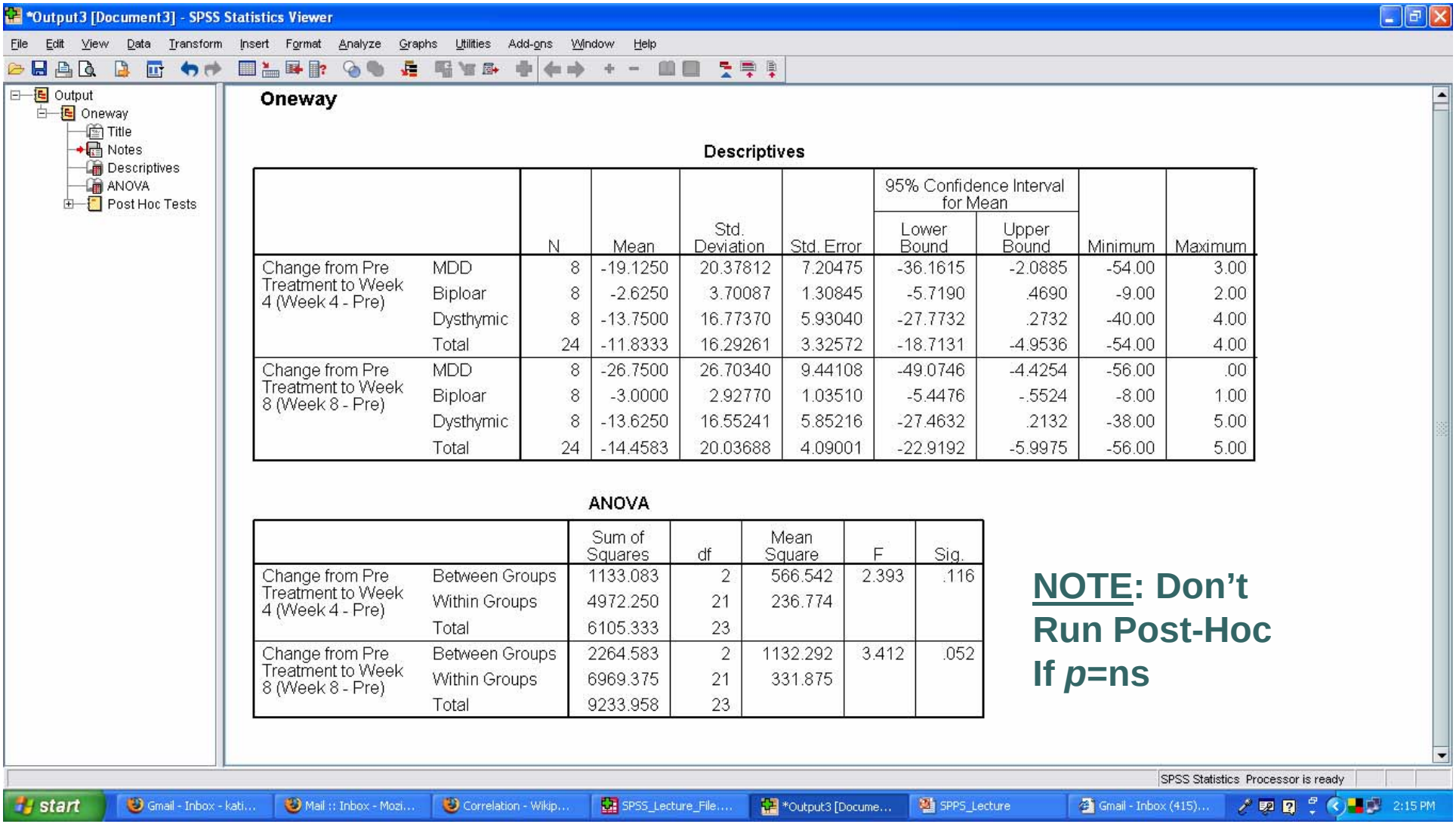


One-Way ANOVA



	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



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

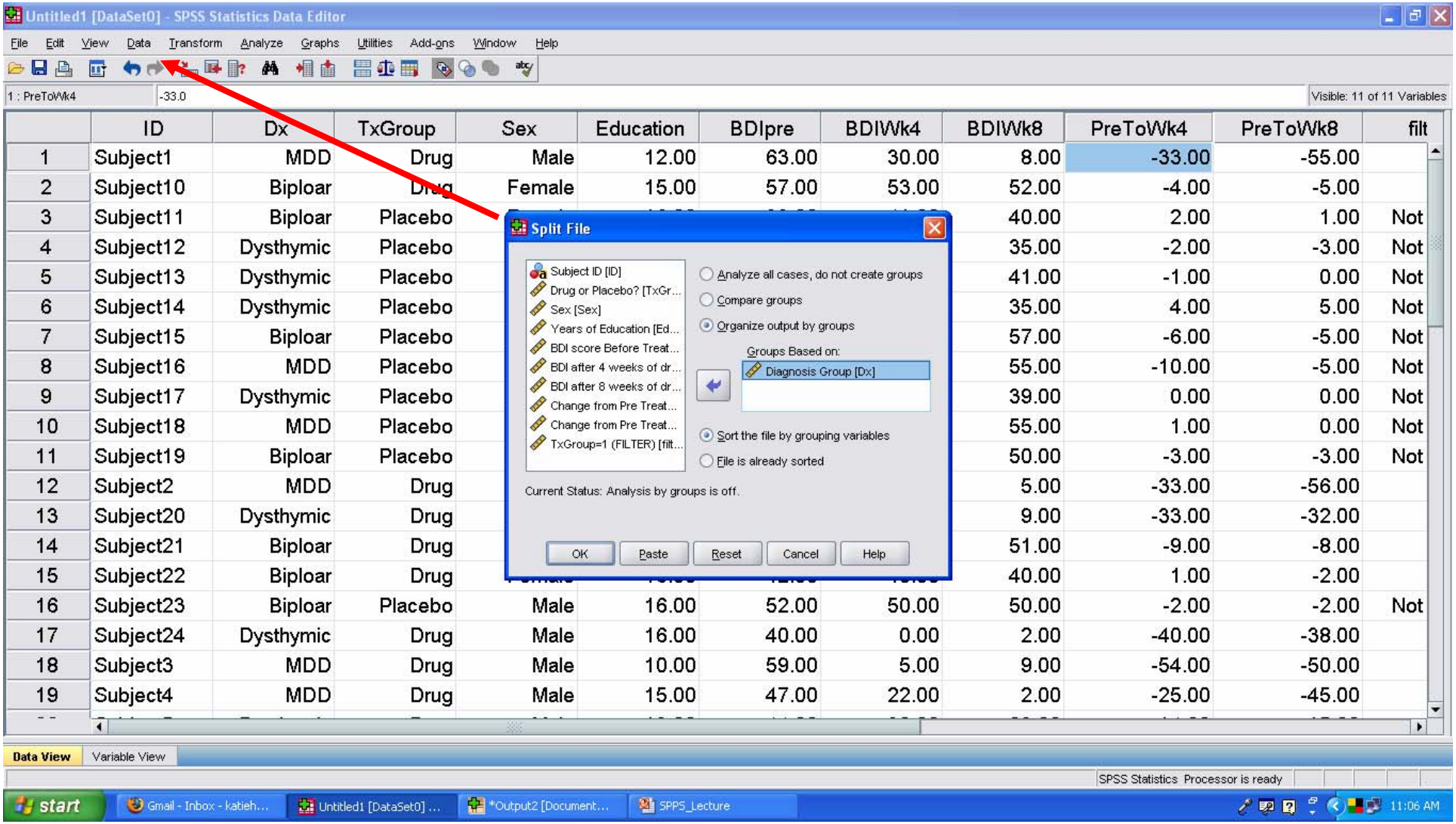
		Sum of Squares	df	Mean Square	F	Sig.
Change from Pre Treatment to Week 4 (Week 4 - Pre)	Between Groups	1133.083	2	566.542	2.393	.116
	Within Groups	4972.250	21	236.774		
	Total	6105.333	23			
Change from Pre Treatment to Week 8 (Week 8 - Pre)	Between Groups	2264.583	2	1132.292	3.412	.052
	Within Groups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

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

Comparing Groups

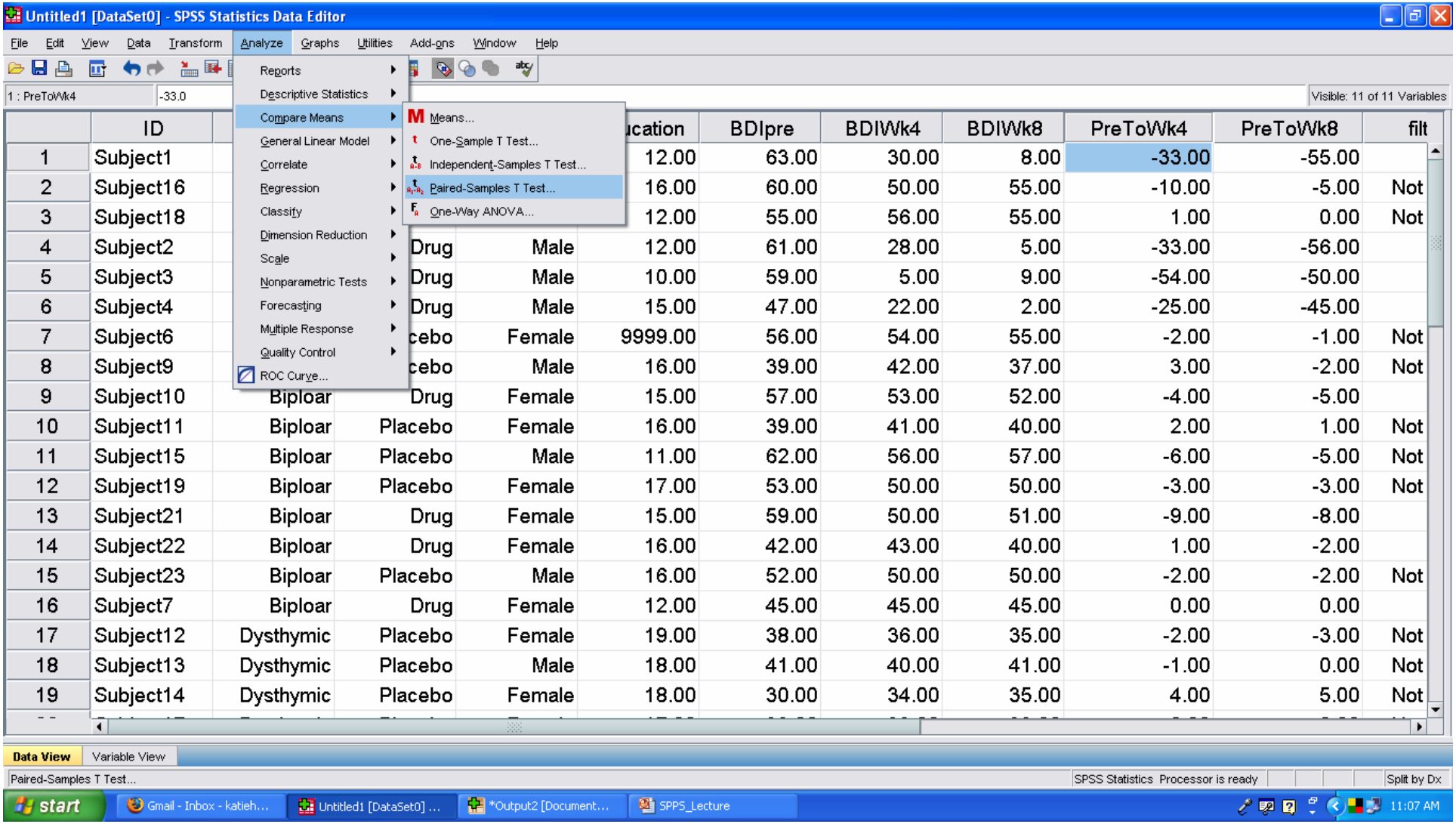
- So we know that the change from Pre to Week 8 was not sig. different *<u>between</u>* the groups
- BUT, was each group's change statistically significant?

Comparing Groups



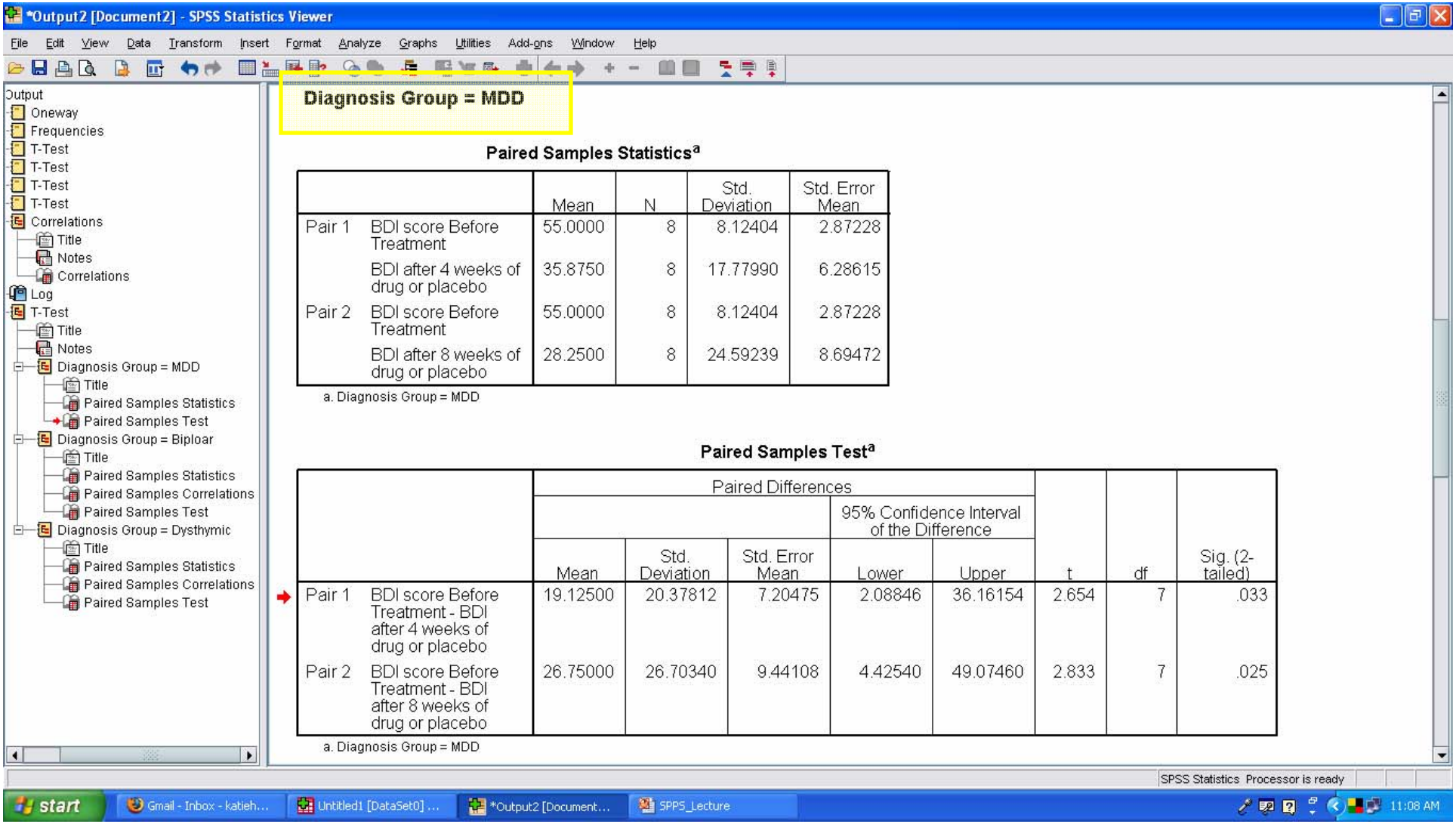
	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10	Biploar	Drug	Female	15.00	57.00	53.00	52.00	-4.00	-5.00	
3	Subject11	Biploar	Placebo					40.00	2.00	1.00	Not
4	Subject12	Dysthymic	Placebo					35.00	-2.00	-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	

Comparing Groups

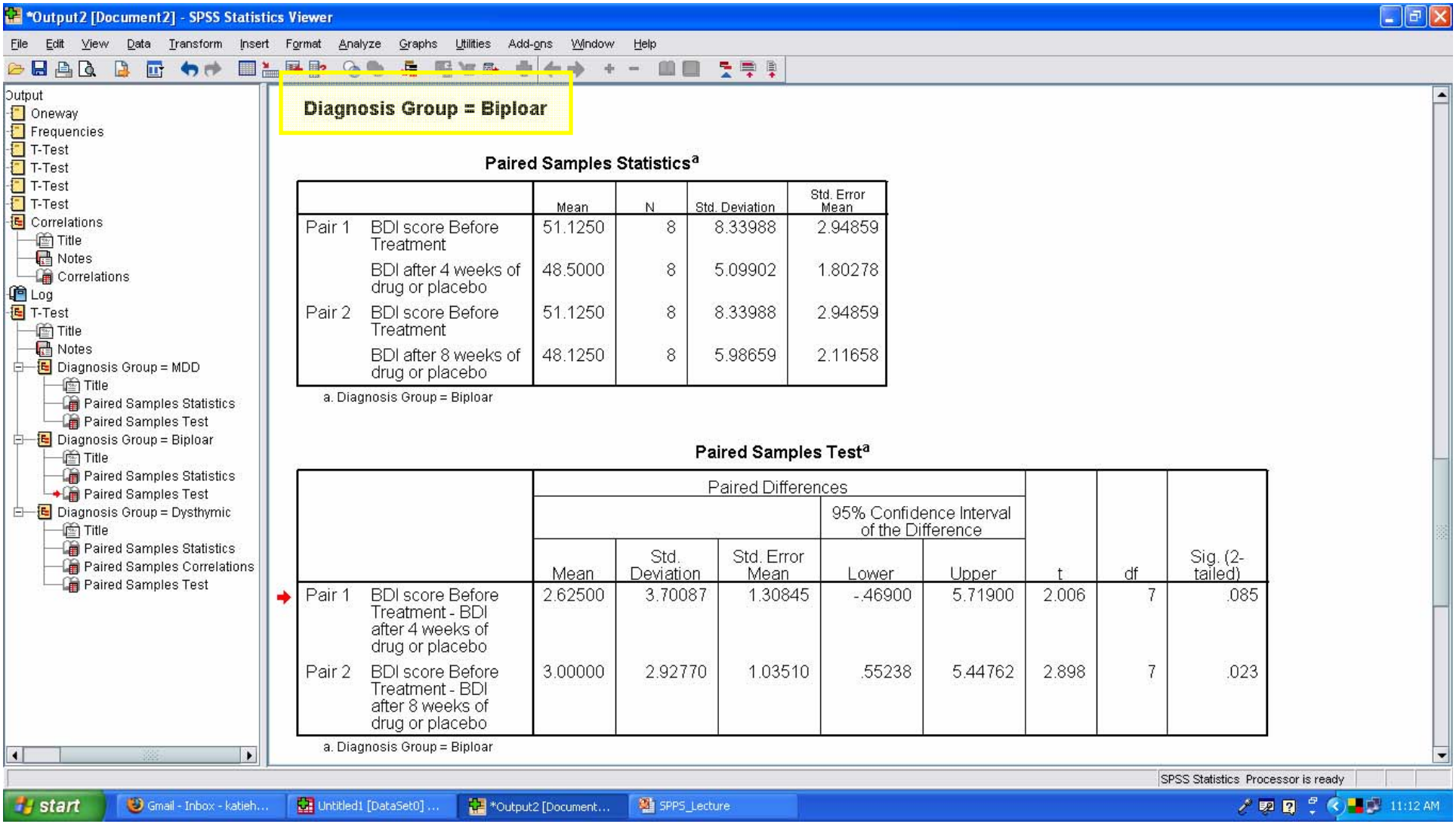


	ID				ucation	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1				12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject16				16.00	60.00	50.00	55.00	-10.00	-5.00	Not
3	Subject18				12.00	55.00	56.00	55.00	1.00	0.00	Not
4	Subject2		Drug	Male	12.00	61.00	28.00	5.00	-33.00	-56.00	
5	Subject3		Drug	Male	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

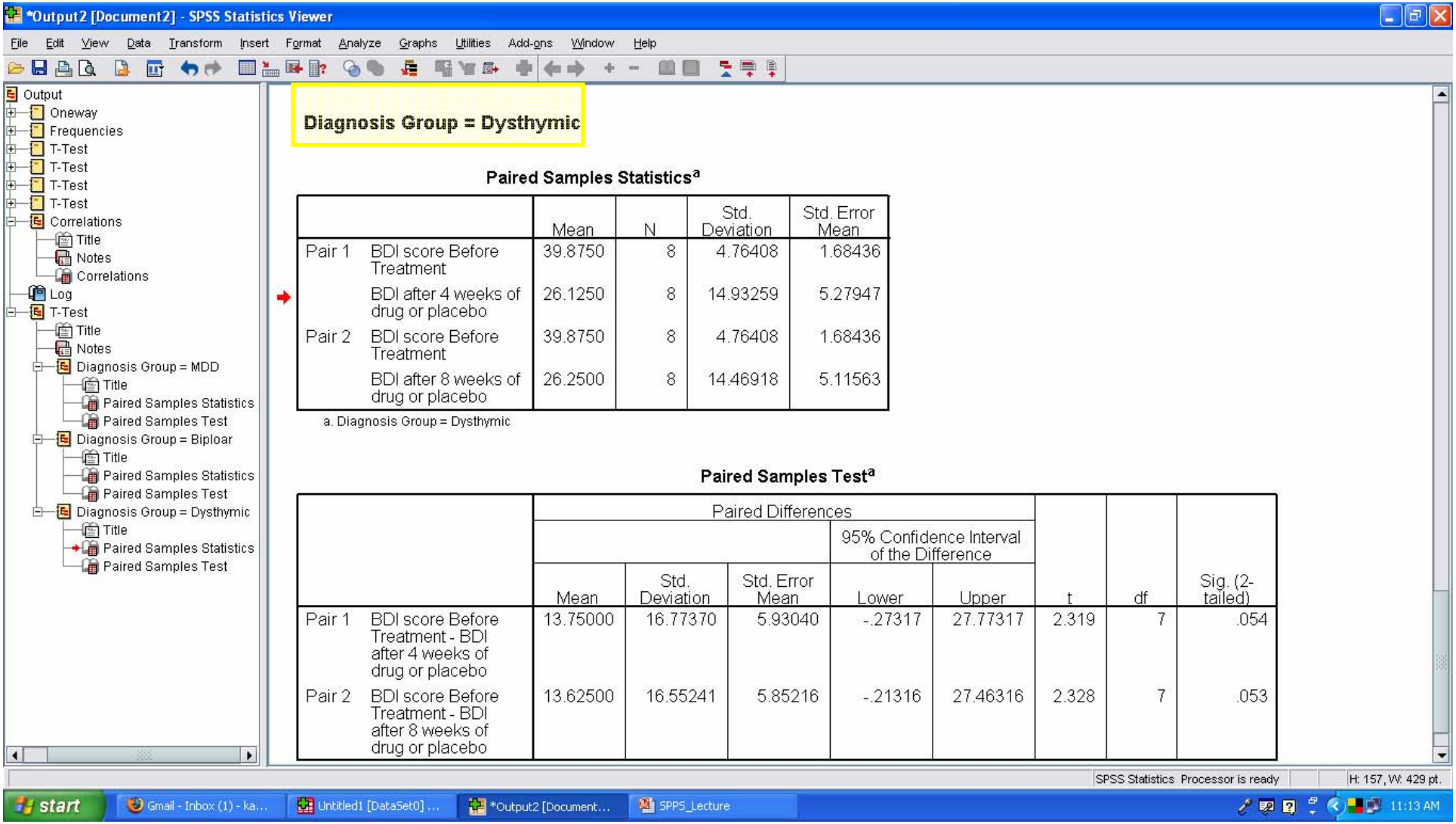
Comparing Groups



Comparing Groups



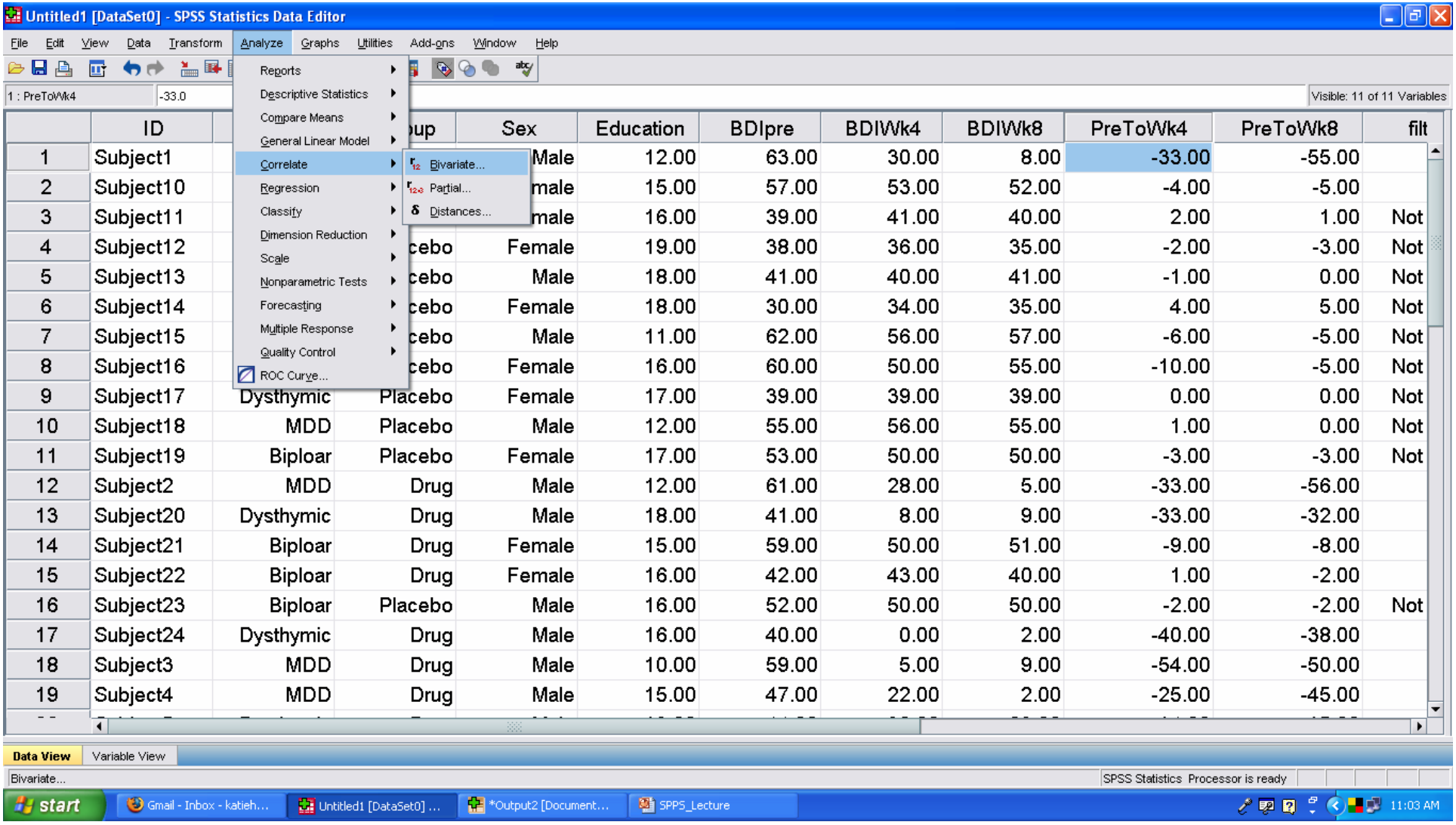
Comparing Groups



Correlations

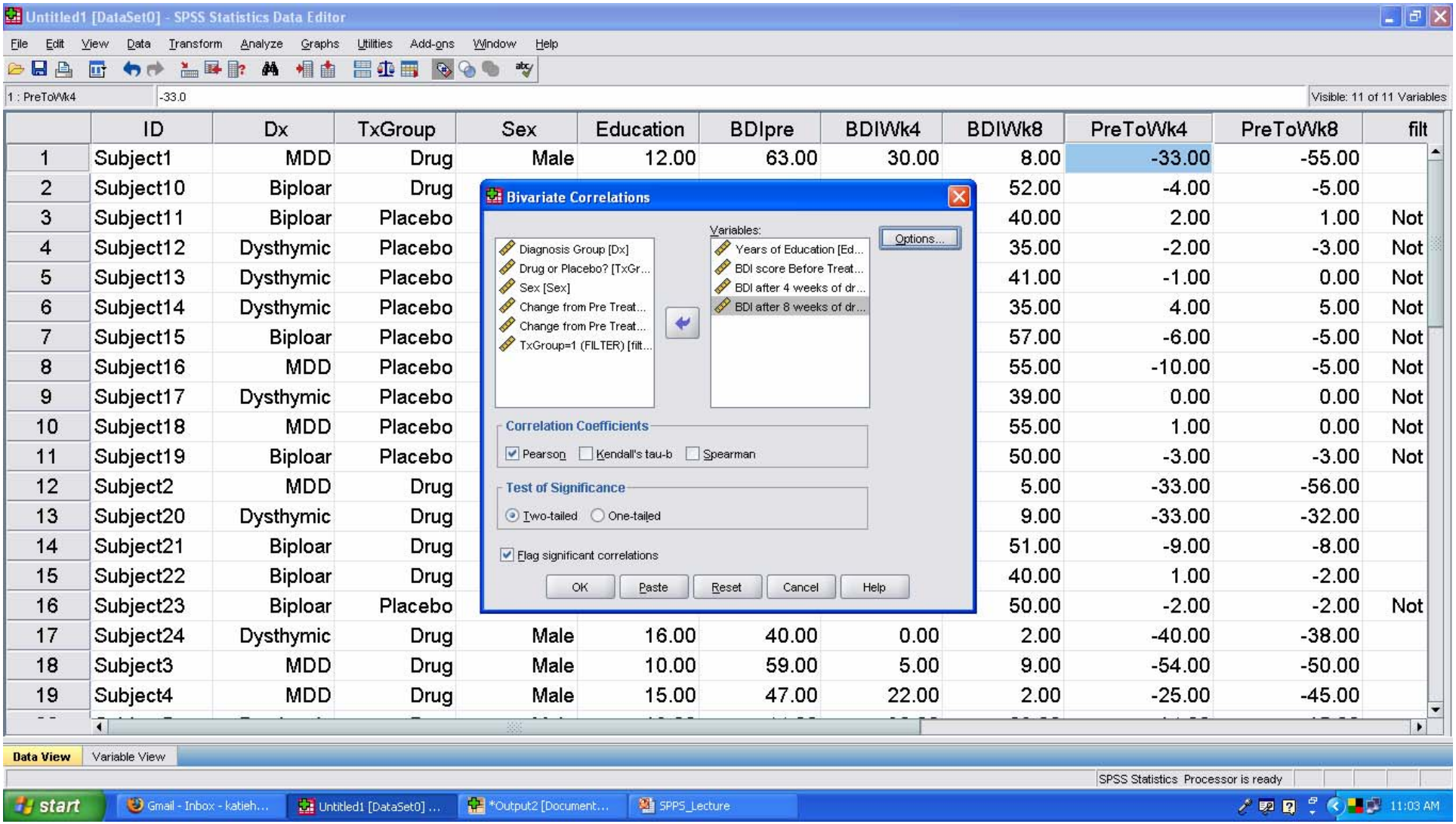
- Strength and direction of a *linear* relationship between two continuous variables
- Pearson product-moment correlation
  - dividing the covariance of the two variables by the product of their SD

Correlations



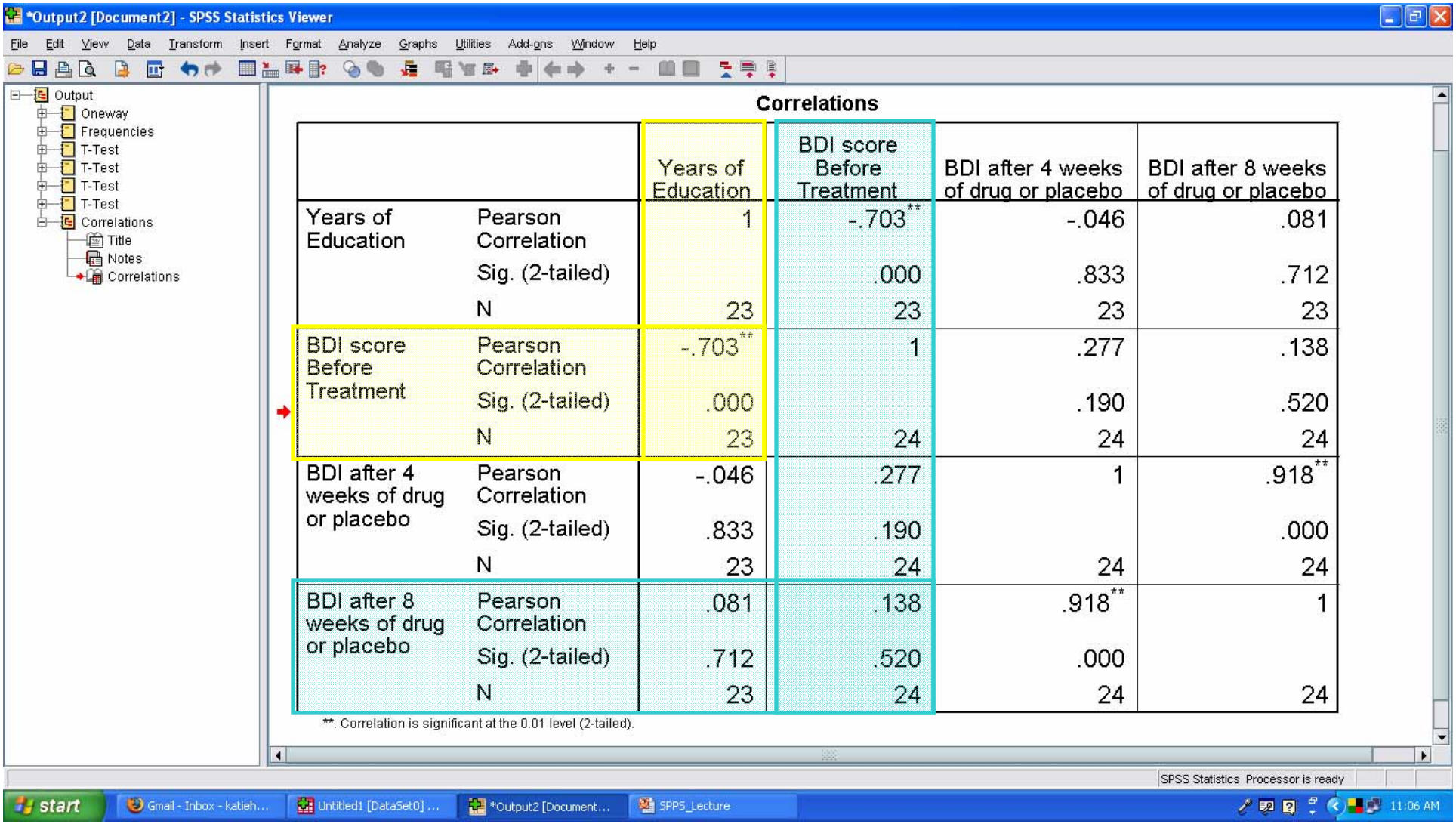
	ID		up	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1			Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10			male	15.00	57.00	53.00	52.00	-4.00	-5.00	
3	Subject11			male	16.00	39.00	41.00	40.00	2.00	1.00	Not
4	Subject12		cebo	Female	19.00	38.00	36.00	35.00	-2.00	-3.00	Not
5	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	

Correlations

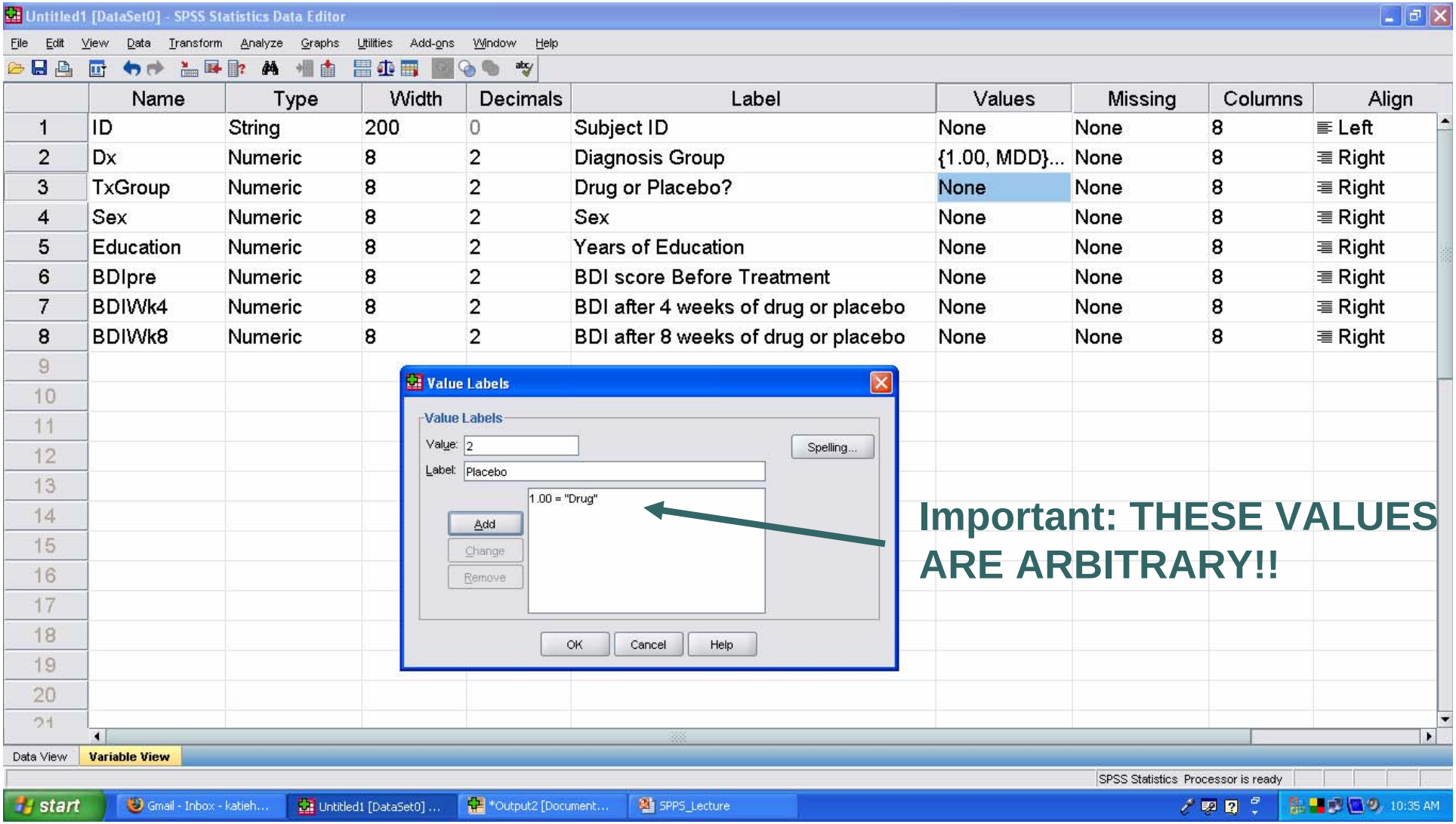


	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject10	Biploar	Drug					52.00	-4.00	-5.00	
3	Subject11	Biploar	Placebo					40.00	2.00	1.00	Not
4	Subject12	Dysthymic	Placebo					35.00	-2.00	-3.00	Not
5	Subject13	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

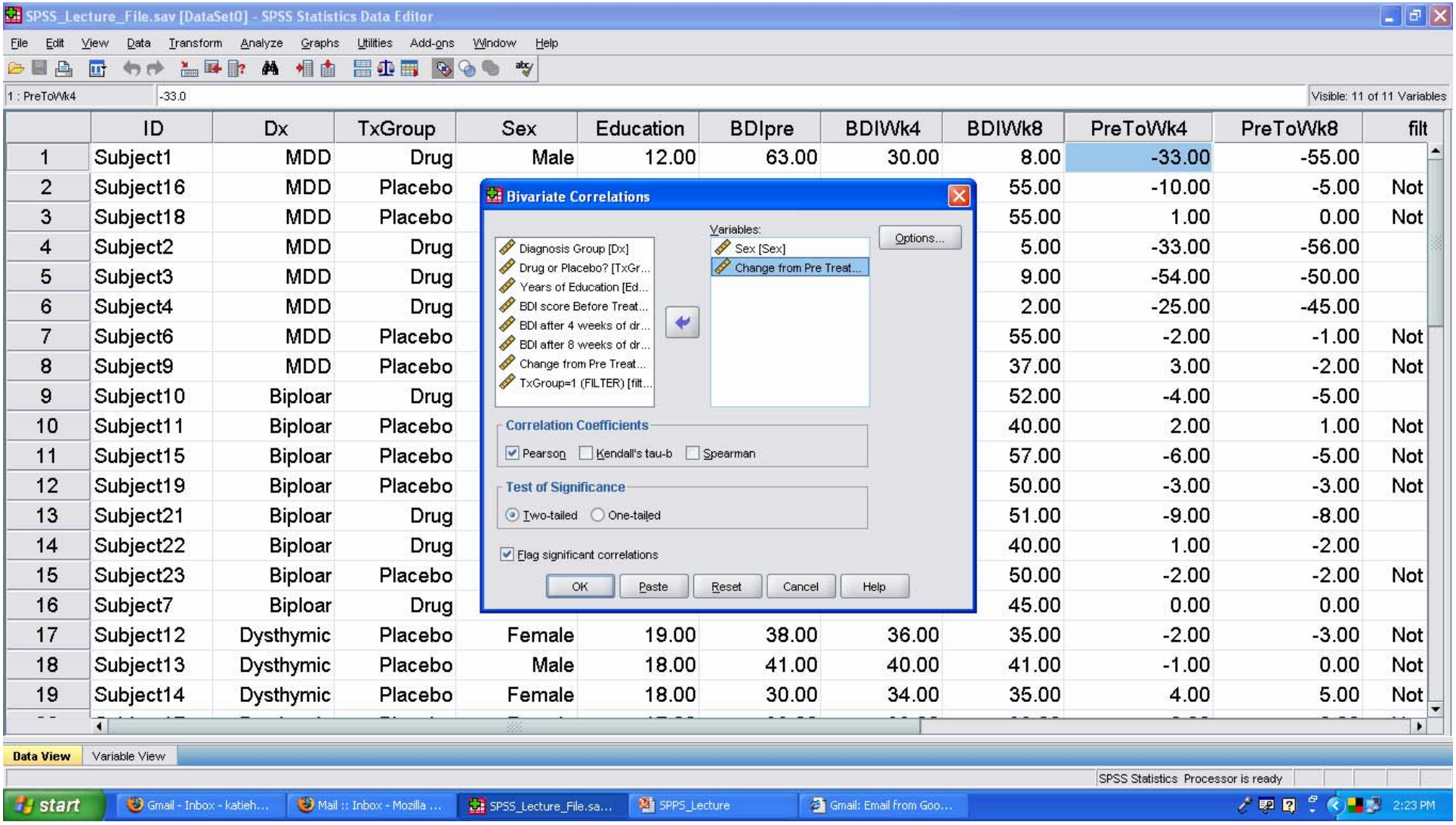


Do NOT Run Correlations on Categorical Variables!!



Correlations

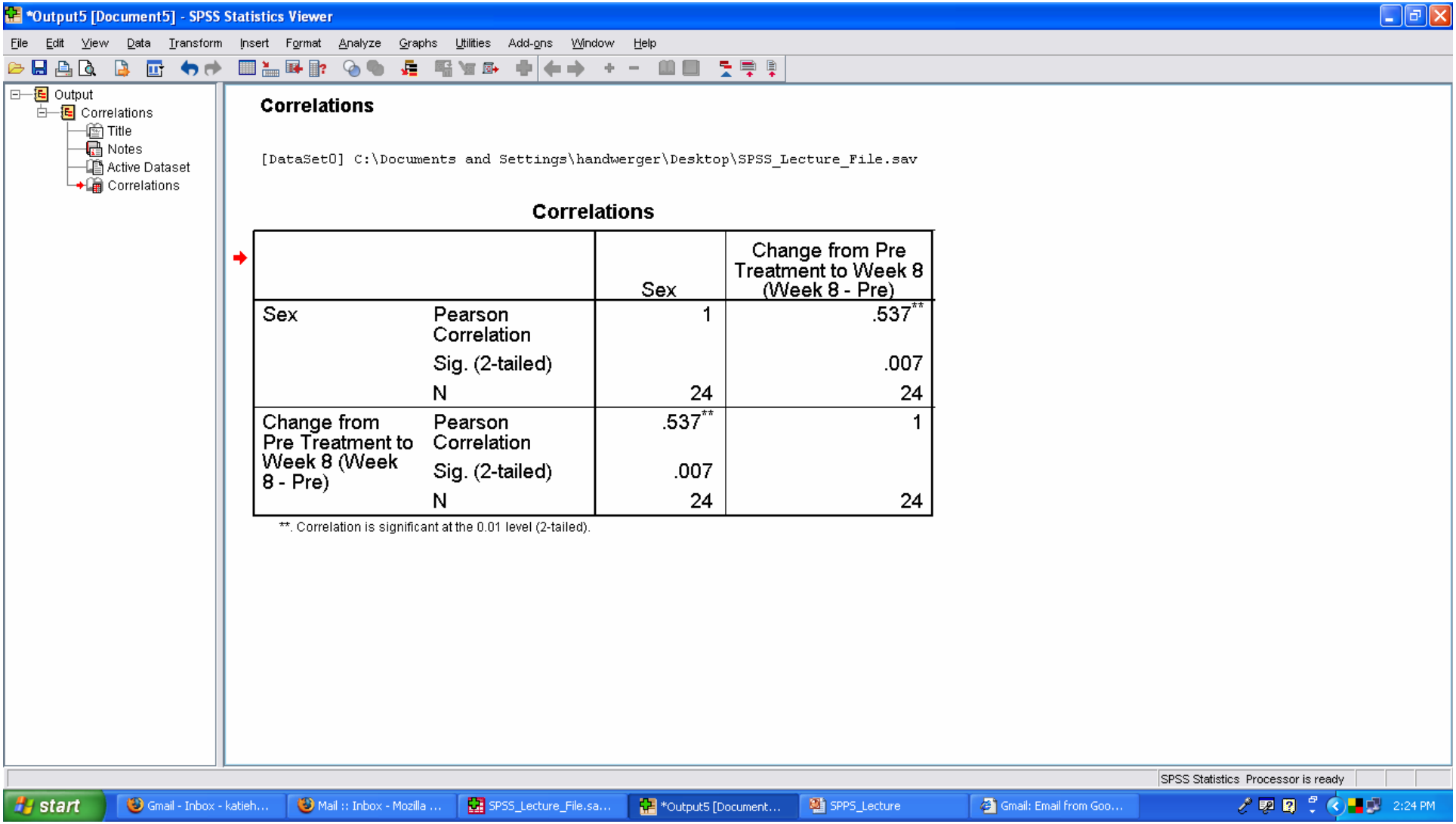
What NOT To Do

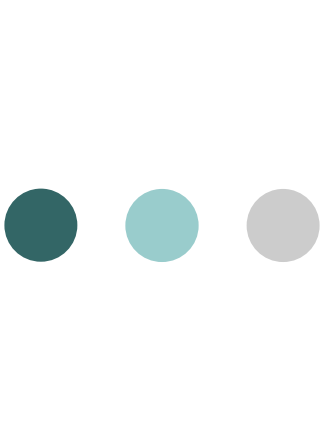


	ID	Dx	TxGroup	Sex	Education	BDIpre	BDIWk4	BDIWk8	PreToWk4	PreToWk8	filt
1	Subject1	MDD	Drug	Male	12.00	63.00	30.00	8.00	-33.00	-55.00	
2	Subject16	MDD	Placebo					55.00	-10.00	-5.00	Not
3	Subject18	MDD	Placebo					55.00	1.00	0.00	Not
4	Subject2	MDD	Drug					5.00	-33.00	-56.00	
5	Subject3	MDD	Drug					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

Correlations

What NOT To Do





The End