

# Moving from SPSS to JMP

Jason Brinkley, PhD  
Assistant Professor, Department of Biostatistics  
College of Allied Health Sciences  
East Carolina University

# Moving from SPSS to JMP

- Comparing the SPSS and JMP paradigms
- Univariate summaries of data in SPSS and JMP
- Visualizing and saving output and reports in SPSS and JMP

# Comparing SPSS and JMP Paradigms

- Each tool handles, process and output analyses differently
- Understanding the foundation elements will help with the transition from SPSS to JMP
- SPSS
  - Users select an analysis, and then SPSS software generates code, submits code and creates output (statistics) that the user can then graph
  - SPSS offers code-based and GUI; GUI generates code
  - Code can be stored and re-run
- JMP
  - Users select variables to analyze, drag and drop them to forms or graph templates, and then JMP creates output (graphs plus statistics)
  - Analyses can be changed, saved, and supplemented without restarting analysis.
  - Data can be subset, excluded, hidden and saved to one data table
  - Graphs are interactively, visually linked to data table and statistics
  - Drag and drop actions and results can be saved to the data table for replay

# Example - Pulse Rate Data

- Public dataset often used to teach statistics.
- Available at Australasian Data and Story Library [www.statsci.org/data/oz/ms212.html](http://www.statsci.org/data/oz/ms212.html) and in JMP File Exchange.
- We will use SPSS 20 and JMP Pro 10. However, Pro features of JMP will not be used.
- The data
  - Students in Professor John Eccleston and Dr. Richard Wilson (University of Queensland) Introductory Statistics class took their own pulse rate and then were asked to flip a coin.
  - Heads - They ran in place for one minute; Tails – They sat for one minute.
  - After one minute, each took their pulse.
  - Data contains pulse rates and other physiological and lifestyle data.

# Presentation of Data - SPSS

12 variables in dataset

Options for data manipulation and analysis are shown above data.

\*Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor

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

3 : Alcohol Yes Visible: 12 of 12 Variables

	ID	Height	Weight	Age	Gender	Smoker	Alcohol	Exercise	Ran	Pulse1	Pulse2	Year	va
1	1	173	57	18	Female	No	Yes	Moderate	Sat	86	88	93	
2	2	179	58	19	Female	No	Yes	Moderate	Ran	82	150	93	
3	3	167	62	18	Female	No	Yes	High	Ran	96	176	93	
4	4	195	84	18	Male	No	Yes	High	Sat	71	73	93	
5	5	173	64	18	Female	No	Yes	Low	Sat	90	88	93	
6	6	184	74	22	Male	No	Yes	Low	Ran	78	141	93	
7	7	162	57	20	Female	No	Yes	Moderate	Sat	68	72	93	
8	8	169	55	18	Female	No	Yes	Moderate	Sat	71	77	93	
9	9	164	56	19	Female	No	Yes	High	Sat	68	68	93	
10	10	168	60	23	Male	No	Yes	Moderate	Ran	88	150	93	
11	11	170	75	20	Male	No	Yes	High	Ran	76	88	93	
12	12	178	58	19	Male	No	No	Low	Sat	74	76	93	
13	13	170	68	22	Male	Yes	Yes	Moderate	Sat	70	71	93	
14	14	187	59	18	Male	No	Yes	High	Sat	78	82	93	
15	15	180	72	18	Male	No	Yes	Moderate	Sat	69	67	93	
16	16	185	110	22	Male	No	Yes	Low	Sat	77	73	93	
17	17	170	56	19	Male	No	No	Low	Sat	64	63	93	

Data View Variable View

IBM SPSS Statistics Processor is ready

Each Dataset has two view tabs. One that shows the actual data and one for variable properties

Data has a mix of numeric and categorical variables. Height in cm and Weight in kg.

# Variable View - SPSS

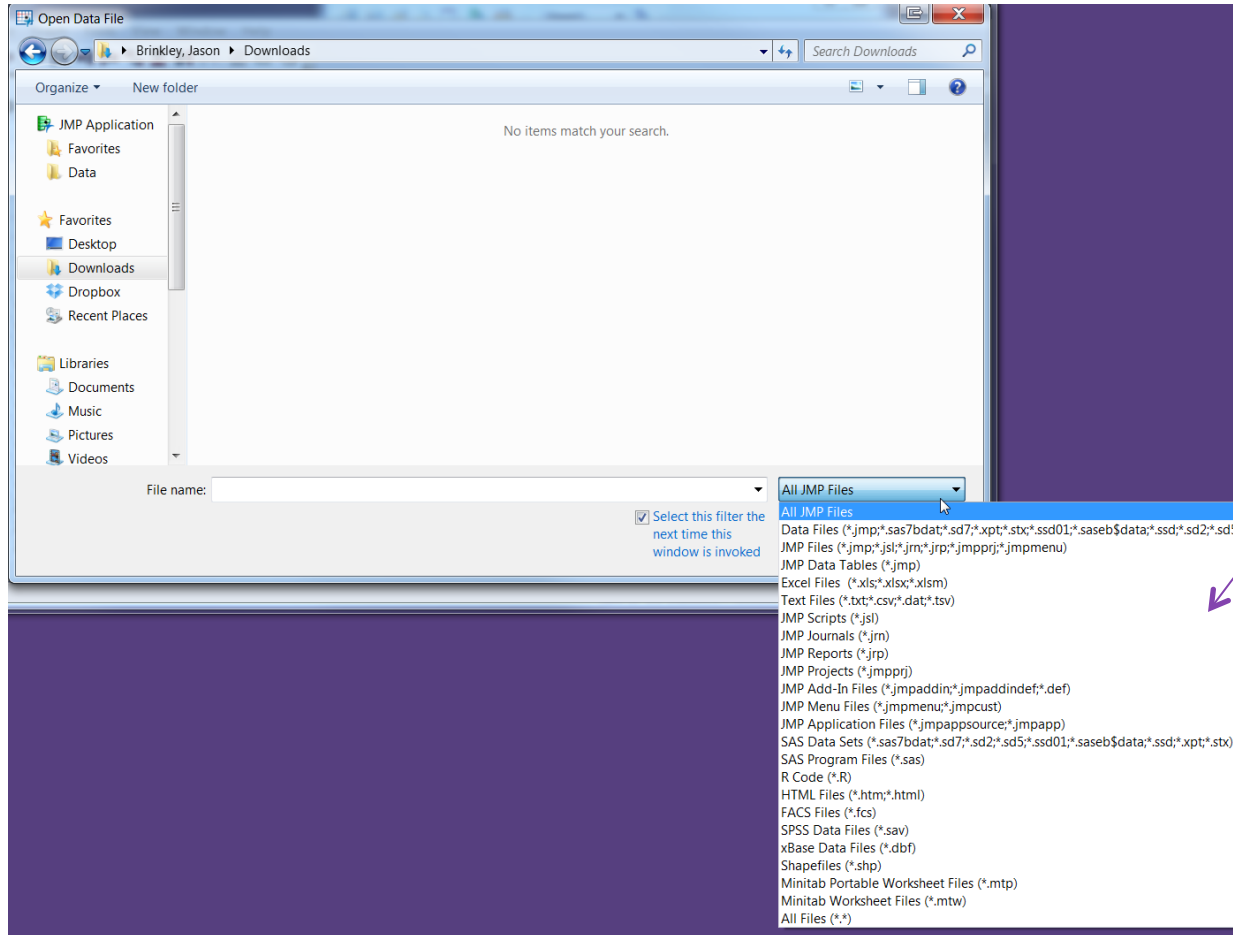
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	ID	Numeric	11	0		None	None	11	Right	Scale	Input
2	Height	Numeric	11	0		None	None	11	Right	Scale	Input
3	Weight	Numeric	11	0		None	None	11	Right	Scale	Input
4	Age	Numeric	11	0		None	None	11	Right	Scale	Input
5	Gender	String	6	0		None	None	6	Left	Nominal	Input
6	Smoker	String	3	0		None	None	6	Left	Nominal	Input
7	Alcohol	String	3	0		None	None	9	Left	Nominal	Input
8	Exercise	String	8	0		None	None	8	Left	Nominal	Input
9	Ran	String	3	0		None	None	3	Left	Nominal	Input
10	Pulse1	Numeric	11	0		None	None	11	Right	Scale	Input
11	Pulse2	Numeric	11	0		None	None	11	Right	Scale	Input
12	Year	Numeric	11	0		None	None	11	Right	Scale	Input
13											
14											
15											
16											
17											
18											
19											
20											

Variable Type

Optional section  
to provide labels.

Data Type – Scale,  
Ordinal, or  
Nominal

# Opening Data - JMP



JMP opens data from many different sources. SPSS included so there is no need to export SPSS datasets. They open in JMP.

# Presentation of Data - JMP

Options for data manipulation and analysis are shown above data

12 variables in dataset

Sheet1 - JMP Pro

File Edit Tables Rows Cols DOE Analyze Graph Tools View Window Help

Columns (12/0)

- ID
- Height
- Weight
- Age
- Gender
- Smoker
- Alcohol
- Exercise
- Ran
- Pulse1
- Pulse2
- Year

Rows

- All rows 110
- Selected 0
- Excluded 0
- Hidden 0
- Labelled 0

	ID	Height	Weight	Age	Gender	Smoker	Alcohol	Exercise	Ran	Pulse1	Pulse2	Year
1	1	173	57	18	Female	No	Yes	Moderate	Sat	86	88	93
2	2	179	58	19	Female	No	Yes	Moderate	Ran	82	150	93
3	3	187	62	18	Female	No	Yes	High	Ran	96	176	93
4	4	195	84	18	Male	No	Yes	High	Sat	71	73	93
5	5	173	64	18	Female	No	Yes	Low	Sat	90	88	93
6	6	184	74	22	Male	No	Yes	Low	Ran	78	141	93
7	7	162	57	20	Female	No	Yes	Moderate	Sat	68	72	93
8	8	169	55	18	Female	No	Yes	Moderate	Sat	71	77	93
9	9	164	56	19	Female	No	Yes	High	Sat	68	68	93
10	10	168	60	23	Male	No	Yes	Moderate	Ran	88	150	93
11	11	170	75	20	Male	No	Yes	High	Ran	76	88	93
12	12	178	58	19	Male	No	No	Low	Sat	74	76	93
13	13	170	68	22	Male	Yes	Yes	Moderate	Sat	70	71	93
14	14	187	59	18	Male	No	Yes	High	Sat	78	82	93
15	15	180	72	18	Male	No	Yes	Moderate	Sat	69	67	93
16	16	185	110	22	Male	No	Yes	Low	Sat	77	73	93
17	17	170	56	19	Male	No	No	Low	Sat	64	63	93
18	18	180	70	18	Male	No	Yes	Moderate	Ran	80	146	93
19	19	166	56	21	Female	Yes	No	Moderate	Sat	83	79	93
20	20	155	50	19	Female	No	No	Moderate	Sat	78	79	93
21	21	175	60	19	Male	No	No	Low	Sat	88	86	93
22	22	140	50	34	Female	No	No	Low	Ran	70	98	93

Row Info

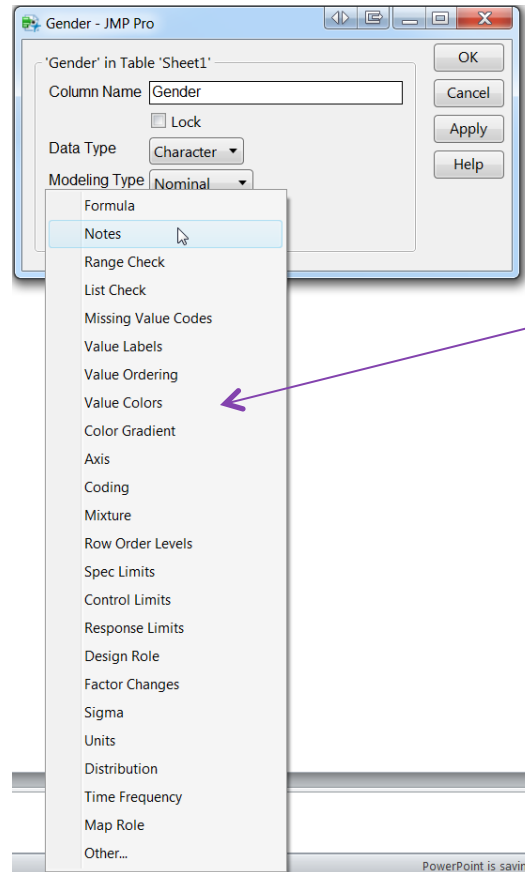
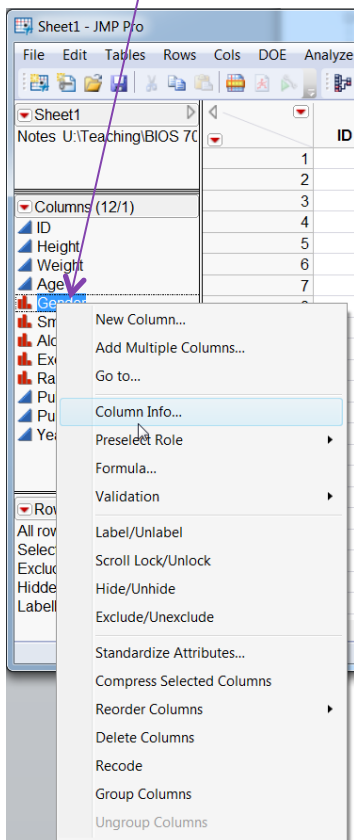
JMP does not have a 'variable view' for data. Instead showing most info in one common area.

Data type – Continuous (Scale), Ordinal, Nominal



# Column Info - JMP

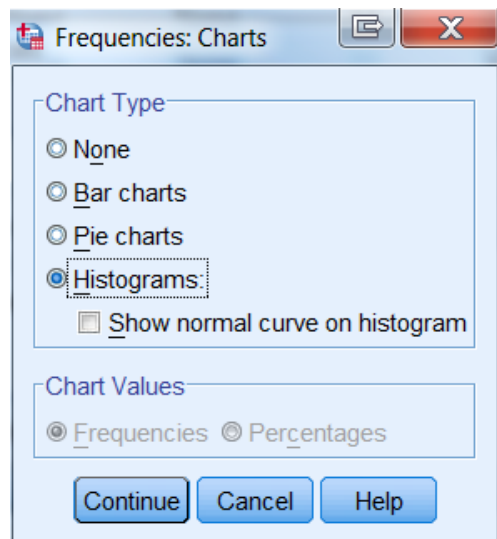
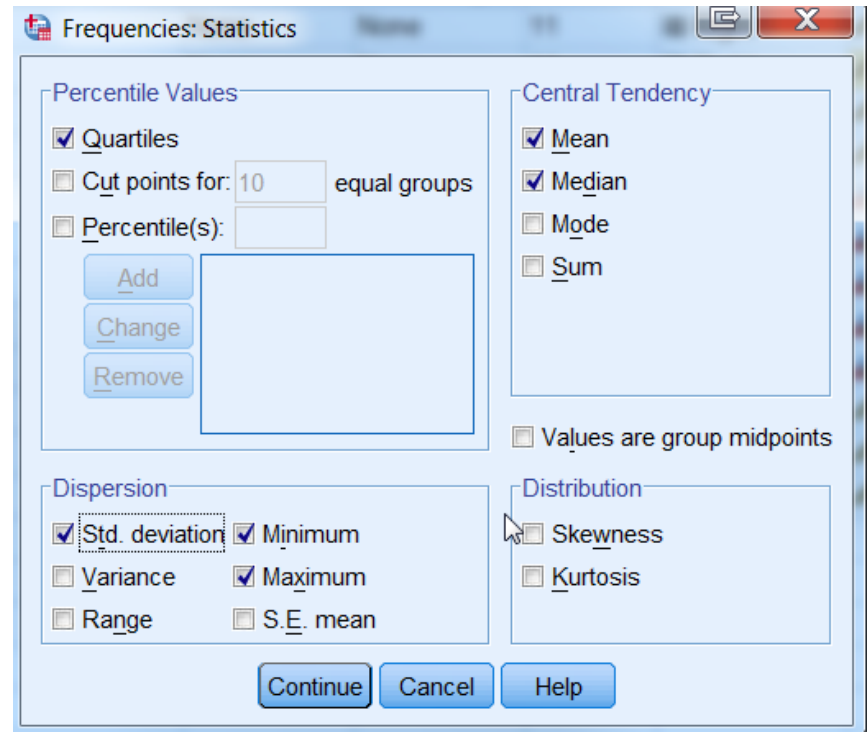
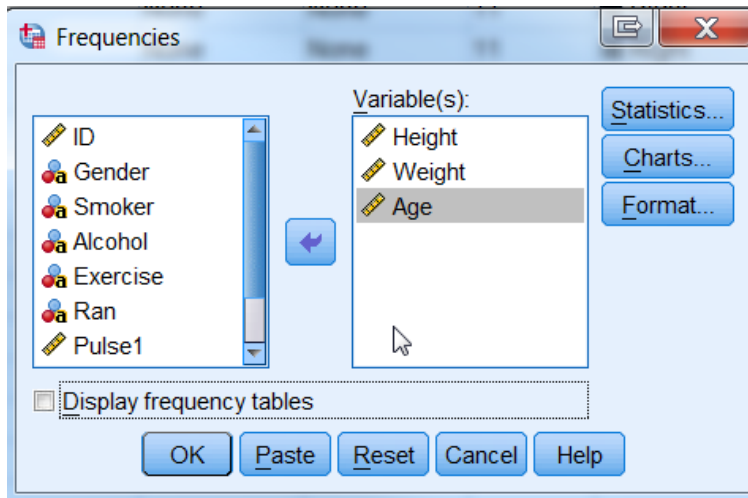
Right click on  
variable of interest.



Options for adding  
labels, reordering  
character variables,  
making data-type  
conversions, etc.

## 2. Univariate Summaries of Data in SPSS and JMP

# Descriptive Stats - SPSS



# Output - SPSS

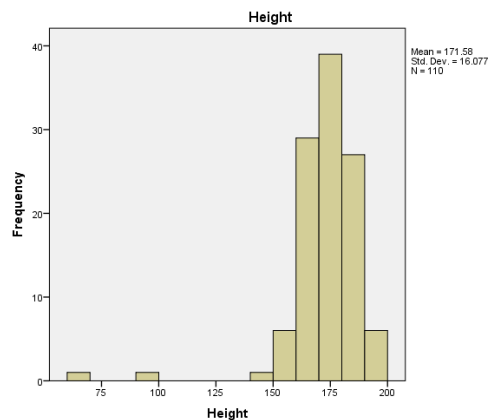
```
/READNAMES=on
/ASSUMEDSTRWIDTH=32767.
EXECUTE.
DATASET NAME DataSet1 WINDOW=FRONT.
FREQUENCIES VARIABLES=Height Weight Age
/FORMAT=NOTABLE
/NTILES=4
/STATISTICS=STDDEV MINIMUM MAXIMUM MEAN MEDIAN
/HISTOGRAM
/ORDER=ANALYSIS.
```

## → Frequencies

[DataSet1]

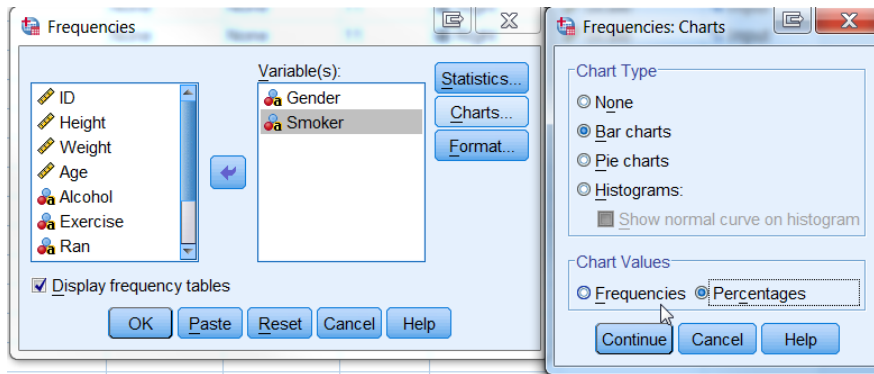
Statistics		Height	Weight	Age
N	Valid	110	110	110
	Missing	0	0	0
Mean		171.58	66.33	20.56
Median		172.50	63.00	20.00
Std. Deviation		16.077	15.157	3.922
Minimum		68	27	18
Maximum		195	110	45
Percentiles	25	165.00	56.00	19.00
	50	172.50	63.00	20.00
	75	180.00	75.00	21.00

## Histogram



Code is generated and then output is given. Some manipulation of output is possible but new options must occur to look at categorical variables.

# Categorical Descriptives - SPSS



```
FREQUENCIES VARIABLES=Gender Smoker
  /BARCHART PERCENT
  /ORDER=ANALYSIS.
```

## ➤ Frequencies

[DataSet1]

Statistics

		Gender	Smoker
N	Valid	110	110
	Missing	0	0

## Frequency Table

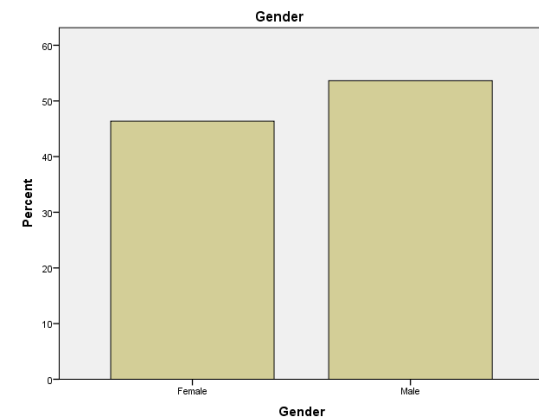
Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	51	46.4	46.4	46.4
	Male	59	53.6	53.6	100.0
	Total	110	100.0	100.0	

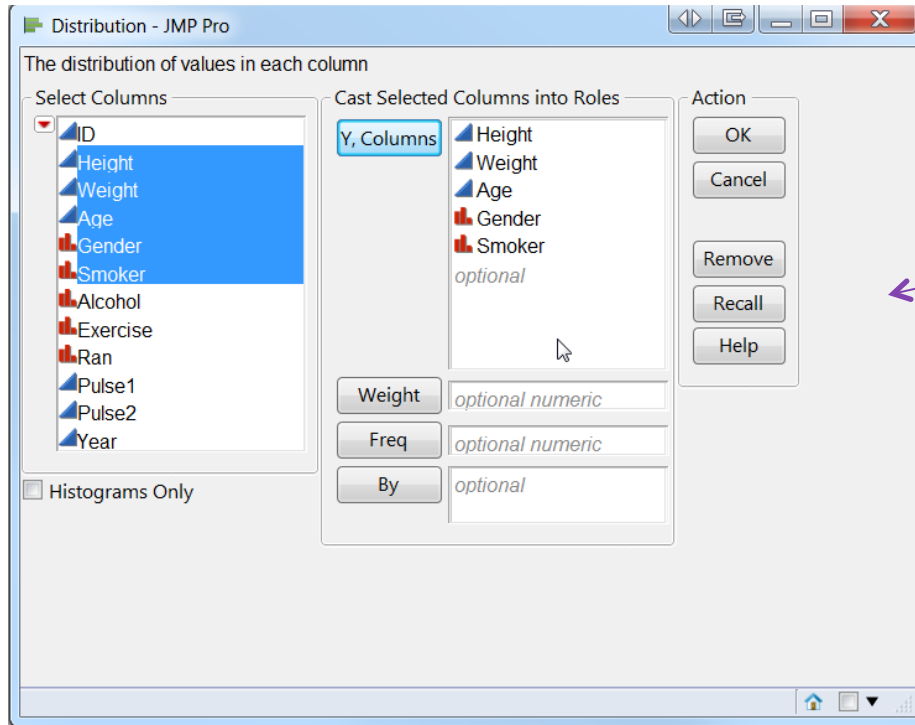
Smoker

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	99	90.0	90.0	90.0
	Yes	11	10.0	10.0	100.0
	Total	110	100.0	100.0	

## Bar Chart

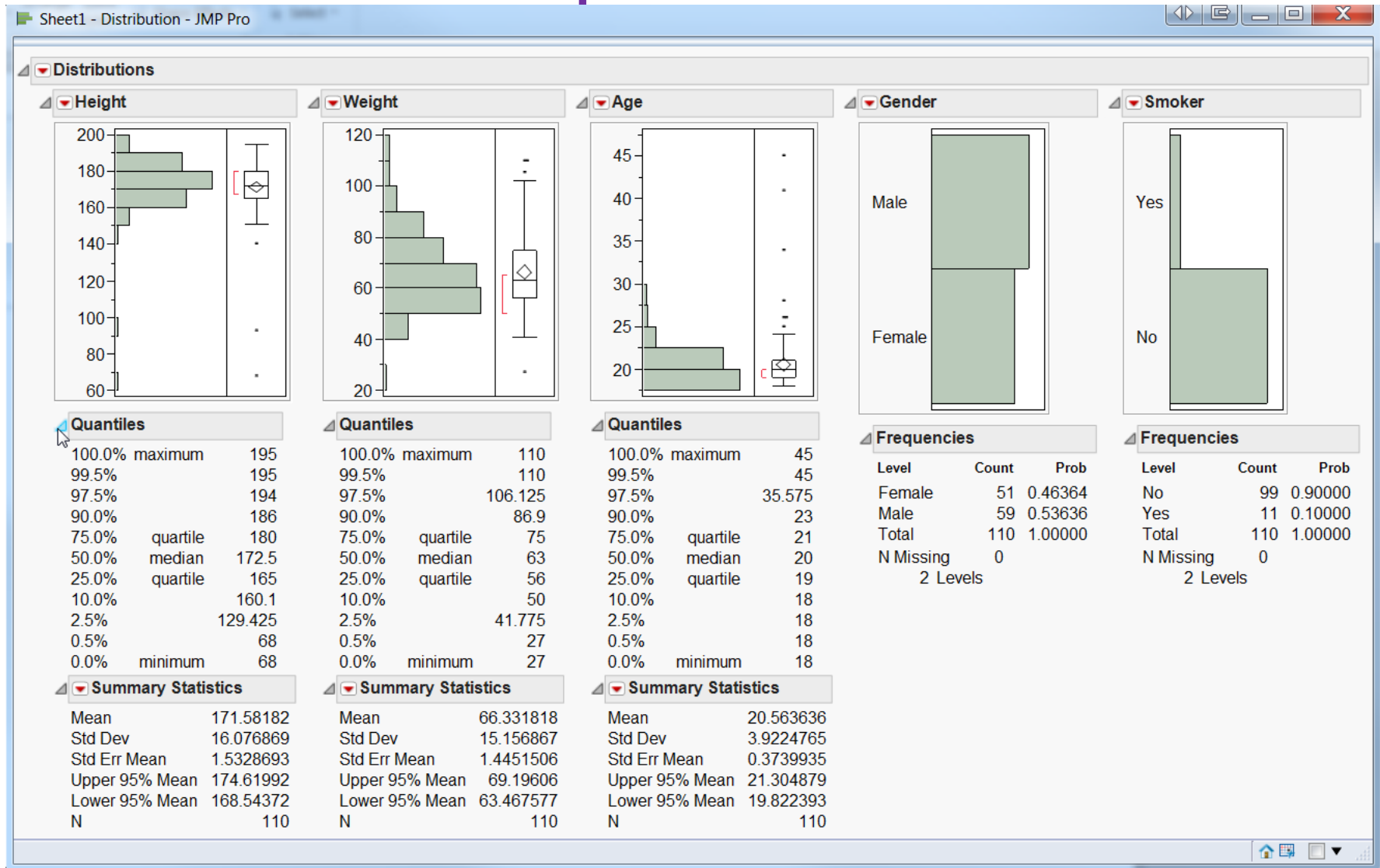


# Descriptive Stats - JMP



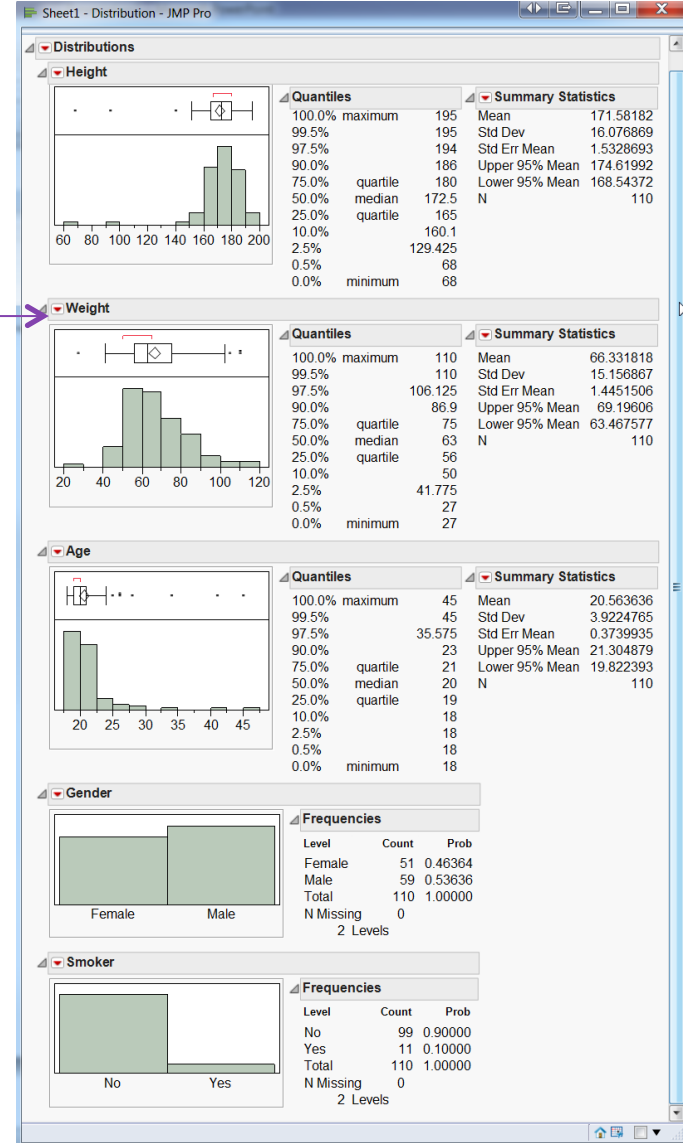
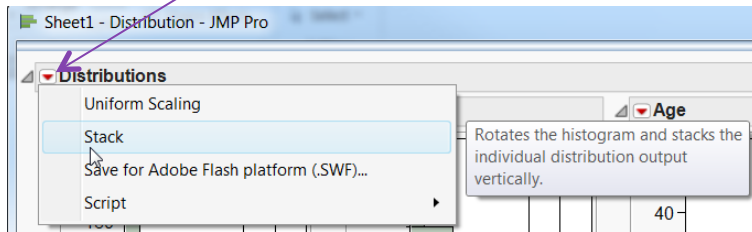
One platform to  
handle all  
variable types

# Output - JMP



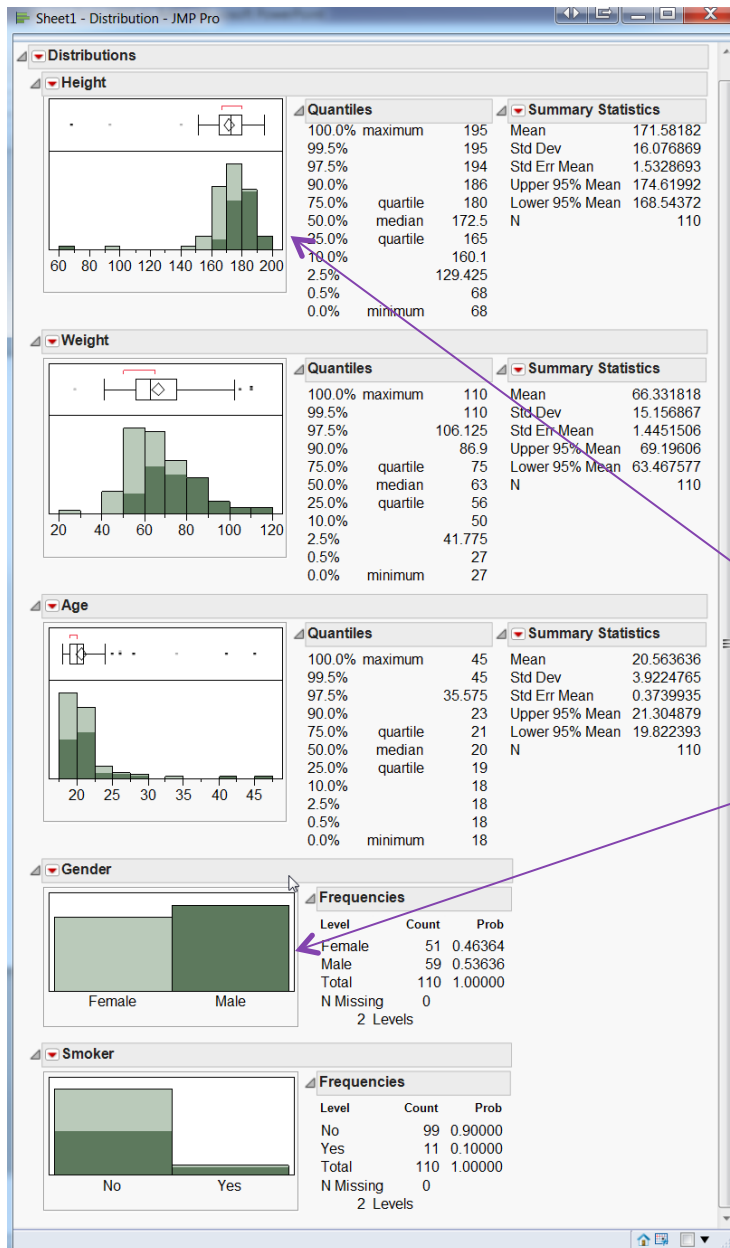
# Output - JMP

Output can be further customized with 'red tabs' associated with different areas of output.





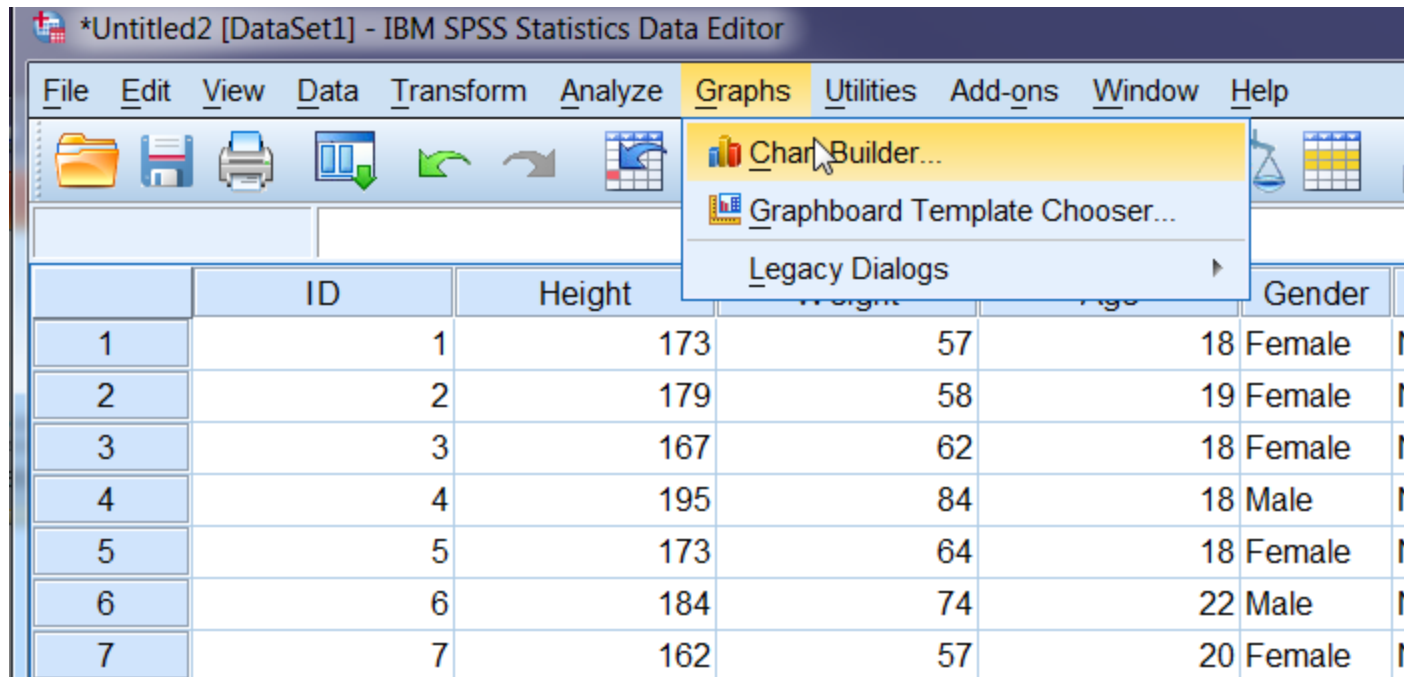
# Output - JMP



JMP dynamically links the output and data. One area this impacts is in the visual exploration of data. Note that when we left click on the 'Male' group that group becomes shaded. We see shading in the other graphs corresponding to the values of the male subjects in our study. We can immediately note that males are taller and heavier.

# 3. Visualizing and Saving Output in SPSS and JMP

# Customized Graphs in SPSS - Chartbuilder

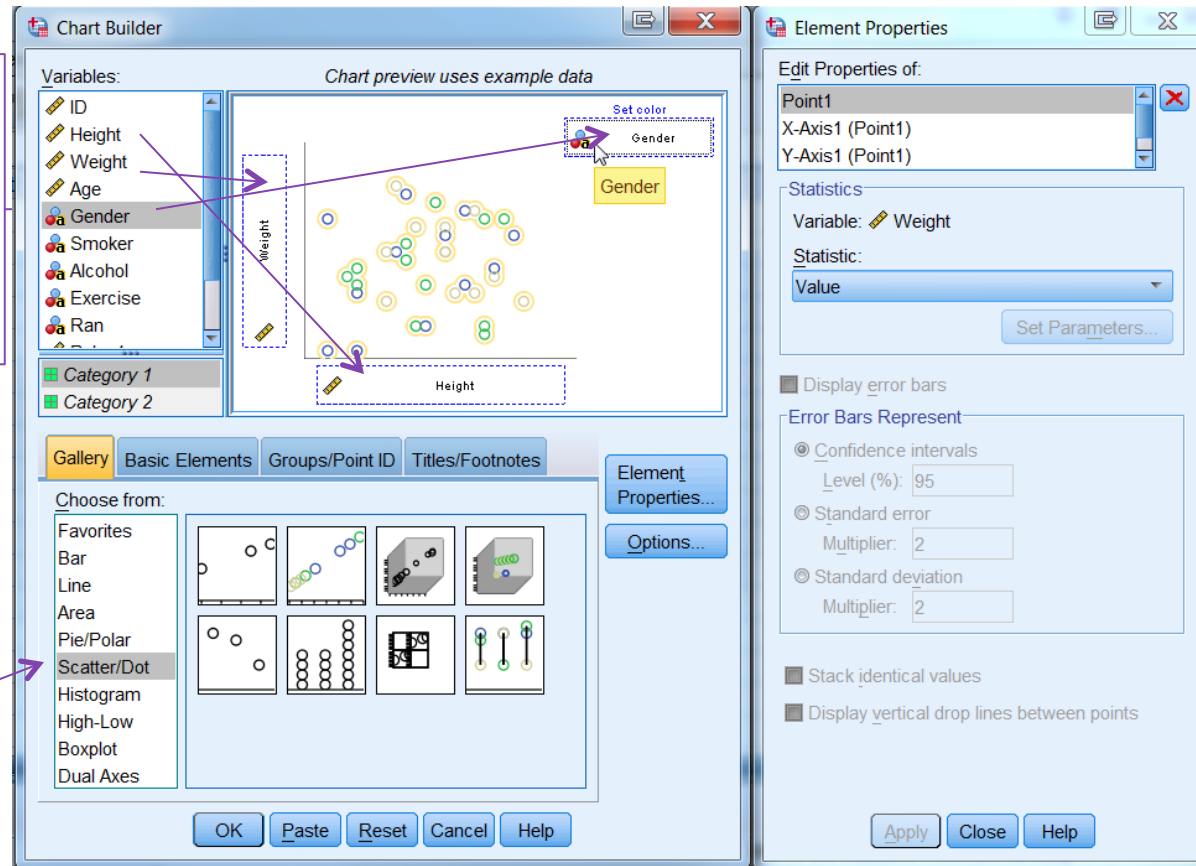


# SPSS

We have selected a scatterplot of Height versus Weight that will be color coded by Gender.

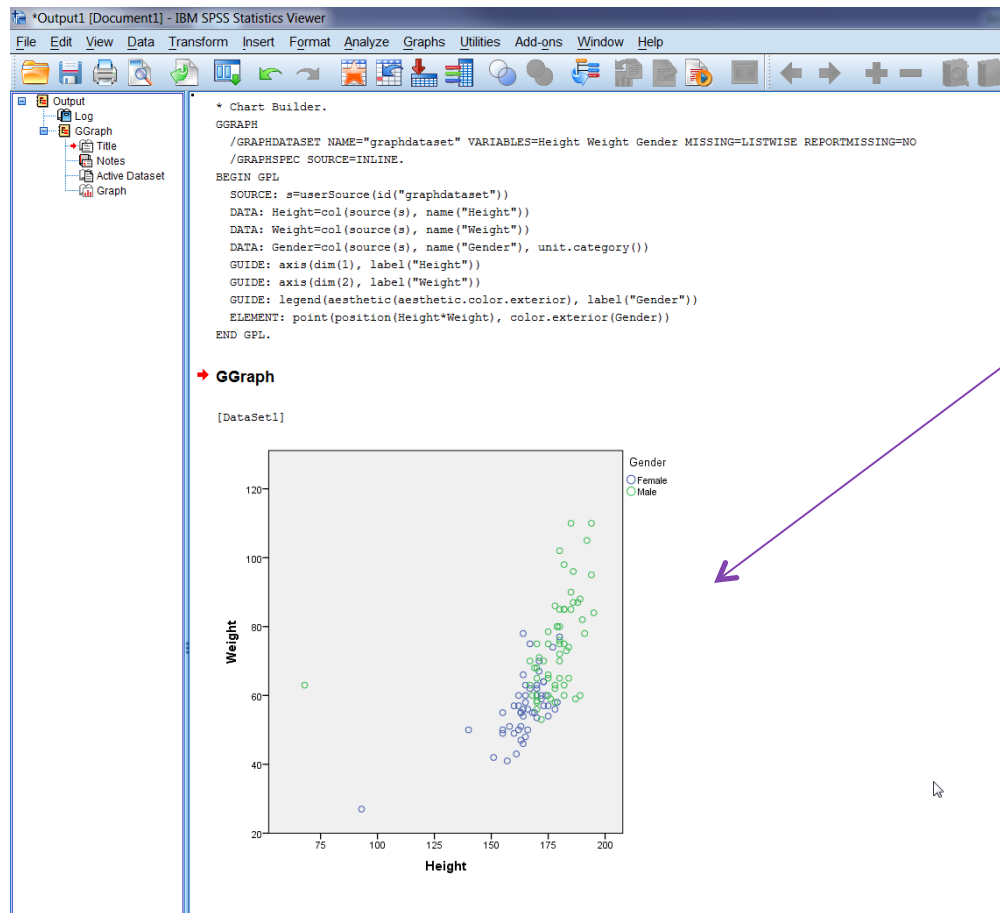
Click and drag variables into important regions or areas.

Pre-select which kind of visual you want for your data.



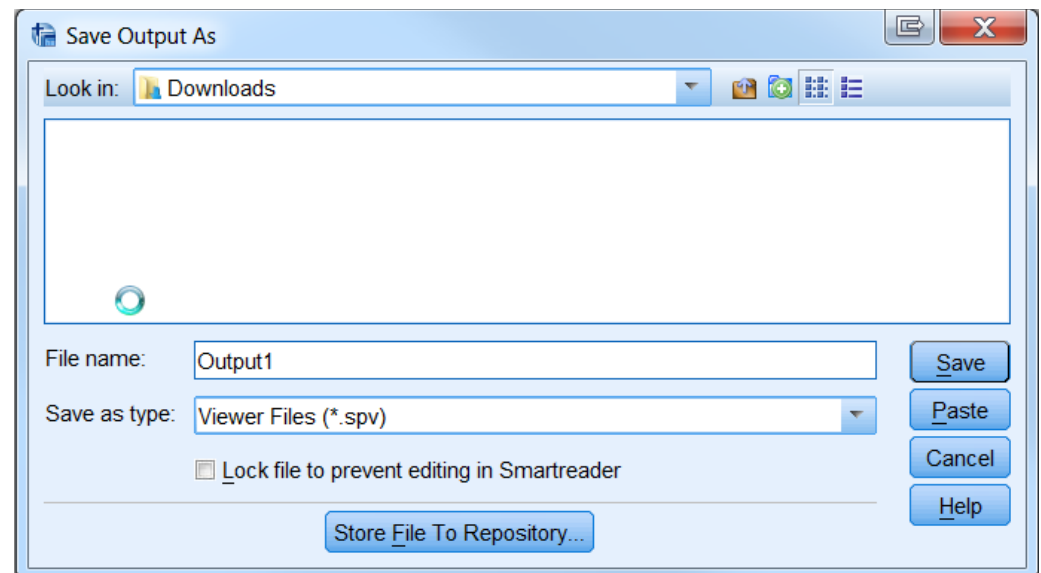
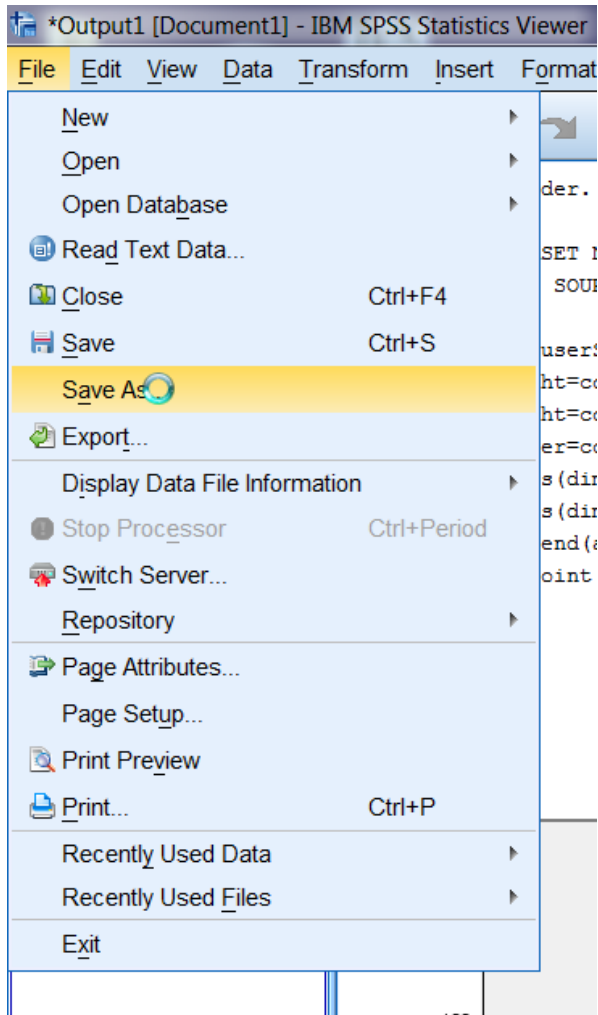
Again, SPSS archetype is for users to pre-plan visualizations from which SPSS creates and runs code.

# Output - SPSS

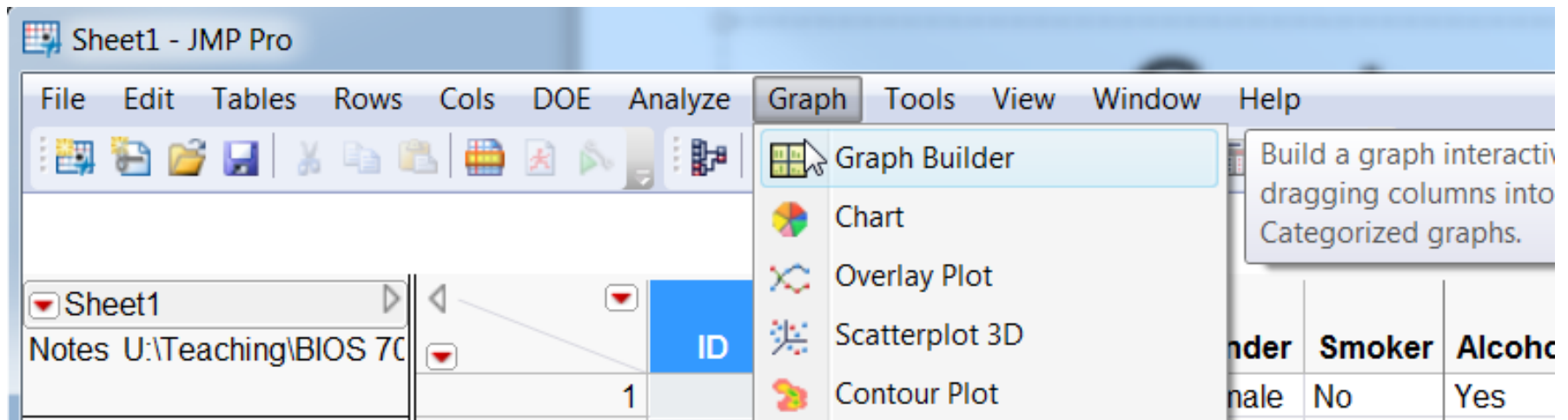


Output Graph or Tables can be copied and pasted into programs such as Microsoft Word and Powerpoint.

# Saving Output and Code for Later Use - SPSS

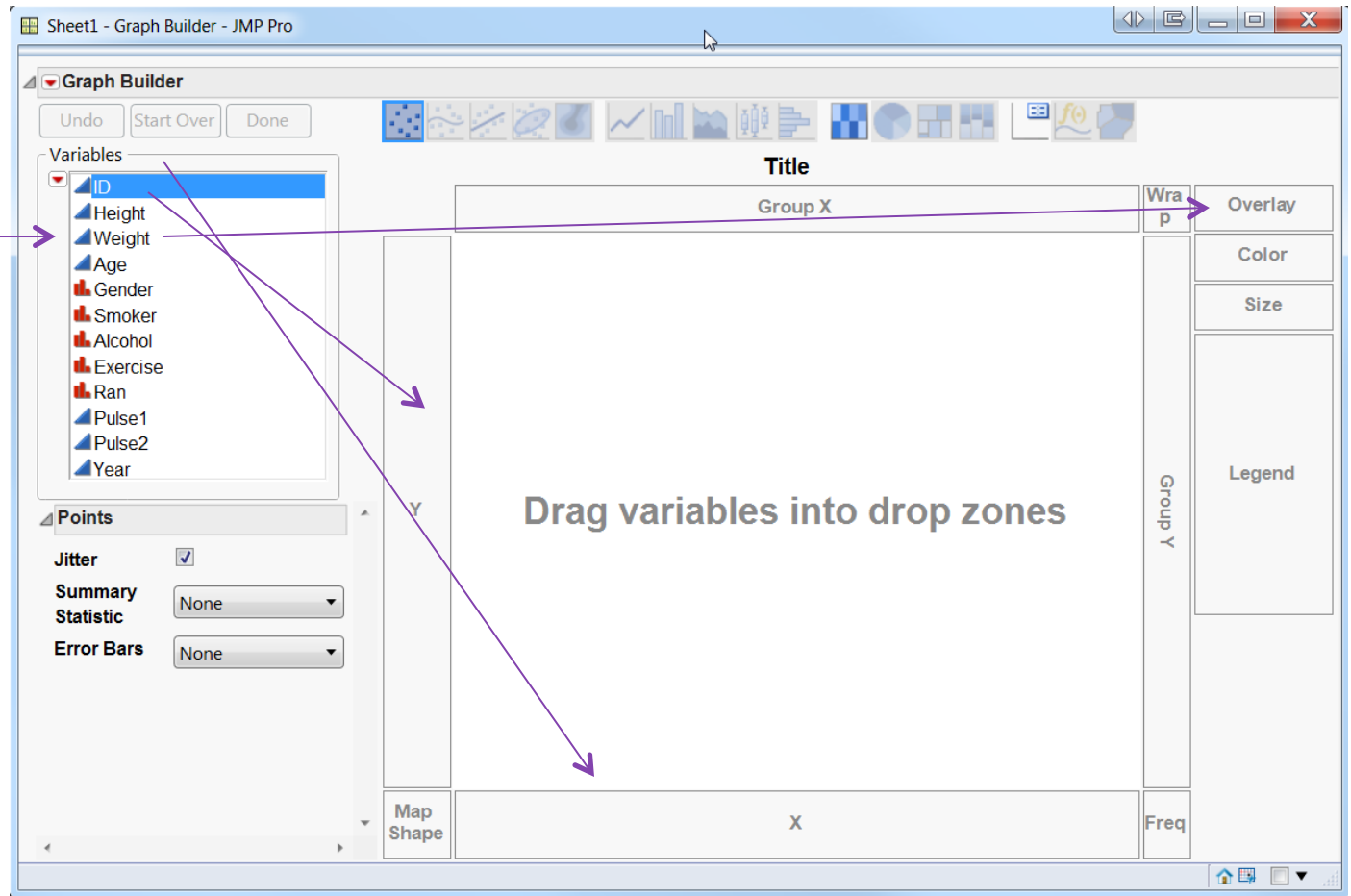


# Customized Graphs in JMP – Graph Builder



# Graph Builder - JMP

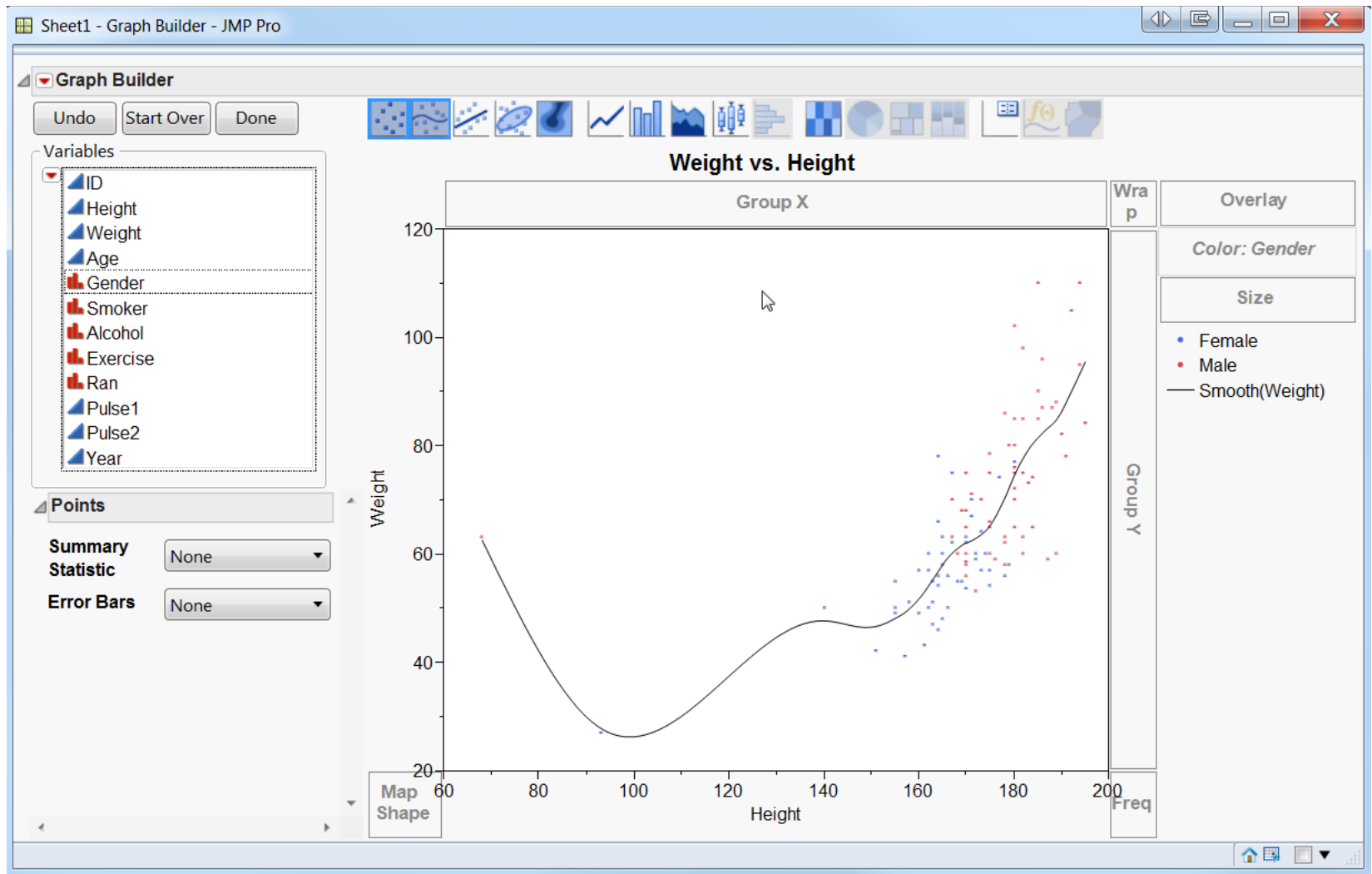
Click and drag variables into regions or areas.



JMP archtype is start down a general path and allow users to customize. Here users interactively create the desired graph.

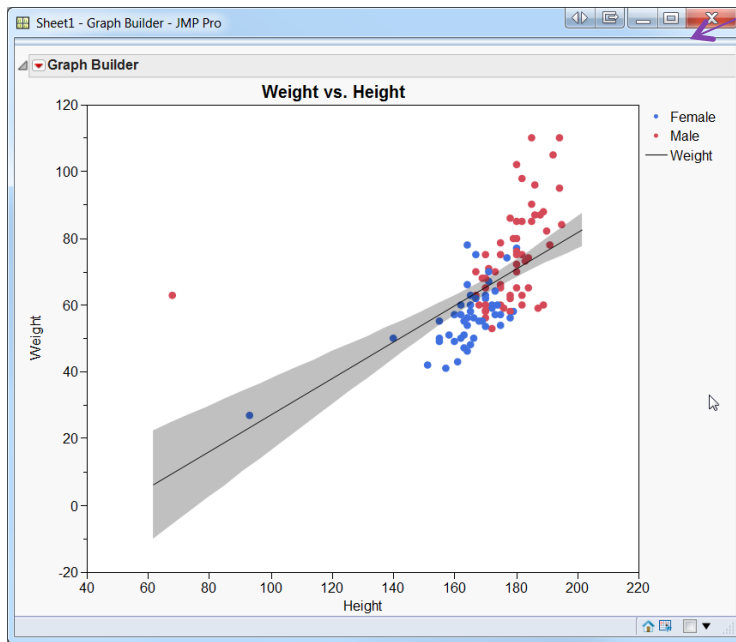


# Graph Builder - JMP

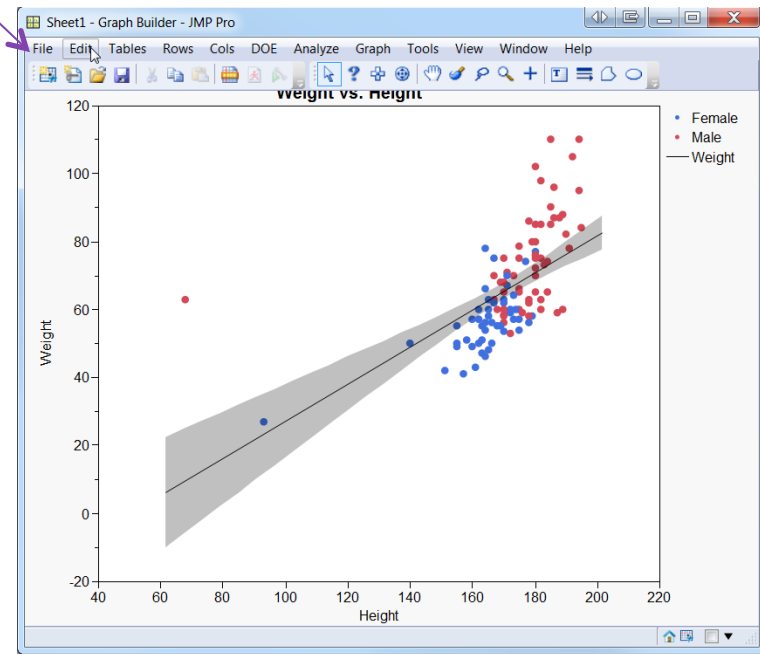


# Graph Builder - JMP: Additional Customizations Available

JMP chooses to hide 'software customizations' as to not confuse user with output customizations. Click on little line above output to retrieve menus that will copy and paste into external programs.

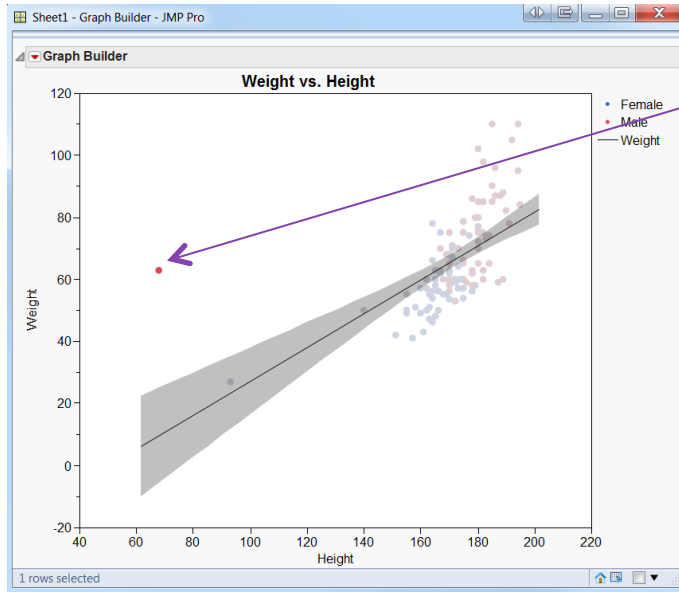


When all changes have been made. Click "Done" for final graph.



# Dynamic Linking - JMP

This is an unusual observation. It really messes with the trend line between Height and Weight.



Dynamically linked output and tables can show us EXACTLY which observation that one is within the data table. Allows for quality control and data checking.

Sheet1 - JMP Pro

File Edit Tables Rows Cols DOE Analyze Graph Tools View Window Help

Sheet1  
Notes U:\Teaching\BIOS 70

Columns (12/1)

- ID
- Height
- Weight
- Age
- Gender
- Smoker
- Alcohol
- Exercise
- Ran
- Pulse1
- Pulse2
- Year

Rows

- All rows 110
- Selected 1
- Excluded 0
- Hidden 0
- Labelled 0

ID	Height	Weight	Age	Gender	Smoker	Alcohol	Exercise	Ran	Pulse1	Pulse2	Year	
94	94	170	58	21	Male	Yes	Yes	Moderate	Sat	90	84	98
95	95	165	58	23	Female	No	Yes	Low	Sat	64	68	98
96	96	164	78	28	Female	No	No	Moderate	Ran	64	120	98
97	97	180	65	20	Male	No	No	Moderate	Ran	88	144	98
98	98	170	62	20	Female	No	Yes	Moderate	Sat	64	64	98
99	99	155	55	20	Female	No	Yes	High	Sat	82	87	98
100	100	165	60	19	Female	Yes	Yes	Low	Ran	88	120	98
101	101	168	55	24	Female	No	No	Moderate	Sat	74	70	98
102	102	68	63	19	Male	No	No	Moderate	Ran	88	136	98
103	103	170	63	20	Female	No	Yes	Low	Ran	92	120	98
104	104	179	80	20	Male	No	No	Moderate	Ran	76	168	98
105	105	163	47	23	Female	Yes	Yes	Low	Ran	71	125	98
106	106	93	27	19	Female	No	No	Low	Sat	119	120	98
107	107	161	43	19	Female	No	No	Low	Sat	90	89	98
108	108	182	60	22	Male	No	Yes	Low	Sat	86	84	98
109	109	170	65	18	Male	No	Yes	High	Sat	69	64	98
110	110	185	85	19	Male	No	Yes	Moderate	Sat	75	68	98

Dist Report Smoker

# Saving Output - JMP



We see a new line in the upper left portion of our data table. We can use the red tab beside that line to immediately re-create our color-coded scatterplot. JMP embeds saved scripts to the data table and when saved as a JMP data file, will retain both the data and scripts used to create analyses in one file.

JMP has a scripting language (JSL) that prefers to run mostly in the background. But one powerful option useful to general users is to save scripts to the data table

The screenshot shows the JMP data table window. The table has columns: ID, Height, Weight, Age, and Gender. A new row has been added to the table, and a red tab is visible next to it. The table data is as follows:

ID	Height	Weight	Age	Gender
94	94	170	58	21 Male
95	95	165	58	23 Female
96	96	164	78	28 Female
97	97	180	65	20 Male
98	98	170	62	20 Female
99	99	155	55	20 Female