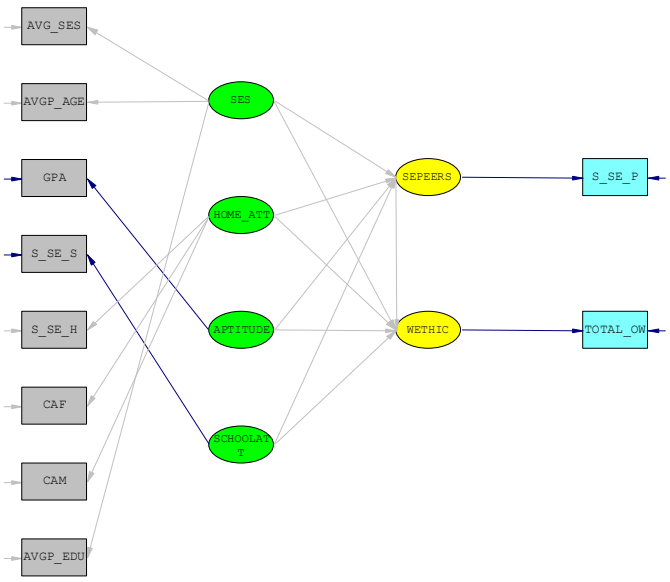
Confidence interval estimates for work ethic data

The data are the scores of 194 freshman students at a high school in Bainbridge, Georgia on ten observed scores (average socio-economic index, average age of parents, grade point average, self-esteem at school, self-esteem at home, self-esteem around peers, attitude towards father, attitude towards mother, work ethic, and average education level of parents). The first couple of observations of the corresponding data file, **STUDENTS.LSF**, are shown below.

STUDENTS.lsf

	AVG_SES	AVGP_AGE	GPA	S_SE_S	S_SE_H	S_SE_P	CAF	CAM	TOTAL_OW	AVGP_EDU
1	35.55	40.50	85.00	20.00	25.00	22.00	15.33	14.00	12.69	3.00
2	34.62	41.50	75.00	26.00	21.00	29.00	12.00	2.00	12.93	2.00
3	30.13	50.50	85.00	24.00	25.00	23.00	19.33	21.33	12.43	1.50
4	35.37	37.00	95.00	23.00	26.00	26.00	5.33	0.00	19.82	7.50
5	22.40	43.50	75.00	20.00	24.00	23.00	24.67	34.00	14.63	1.50
6	15.96	29.50	85.00	24.00	26.00	25.00	7.33	0.00	12.89	1.50
7	22.75	49.00	95.00	24.00	25.00	31.00	56.67	4.00	18.29	3.00
8	37.31	47.00	75.00	24.00	24.50	17.00	7.33	50.00	10.56	2.00
9	22.70	37.00	85.00	27.00	30.00	24.00	50.00	34.00	11.13	2.00
10	22.54	42.50	85.00	26.00	27.00	27.00	6.67	4.67	13.02	2.00
11	23.50	30.50	75.00	24.00	29.00	26.00	50.00	50.00	11.74	1.00
12	23.28	29.00	85.00	27.00	27.50	22.00	0.00	4.17	16.82	3.00
13	23.43	35.50	85.00	25.00	21.00	26.00	6.00	6.67	13.55	2.00
14	30.91	32.50	85.00	25.00	25.00	24.00	36.67	42.00	11.99	4.00
15	49.20	45.00	85.00	34.00	25.00	32.00	14.67	7.33	14.95	2.00

The theoretical model is a structural equation model that suggests that socio-economic status, home environment, grade point average, and self-esteem at school are antecedents of self-esteem around peers and work ethic. A path diagram for this model is depicted in the image below.



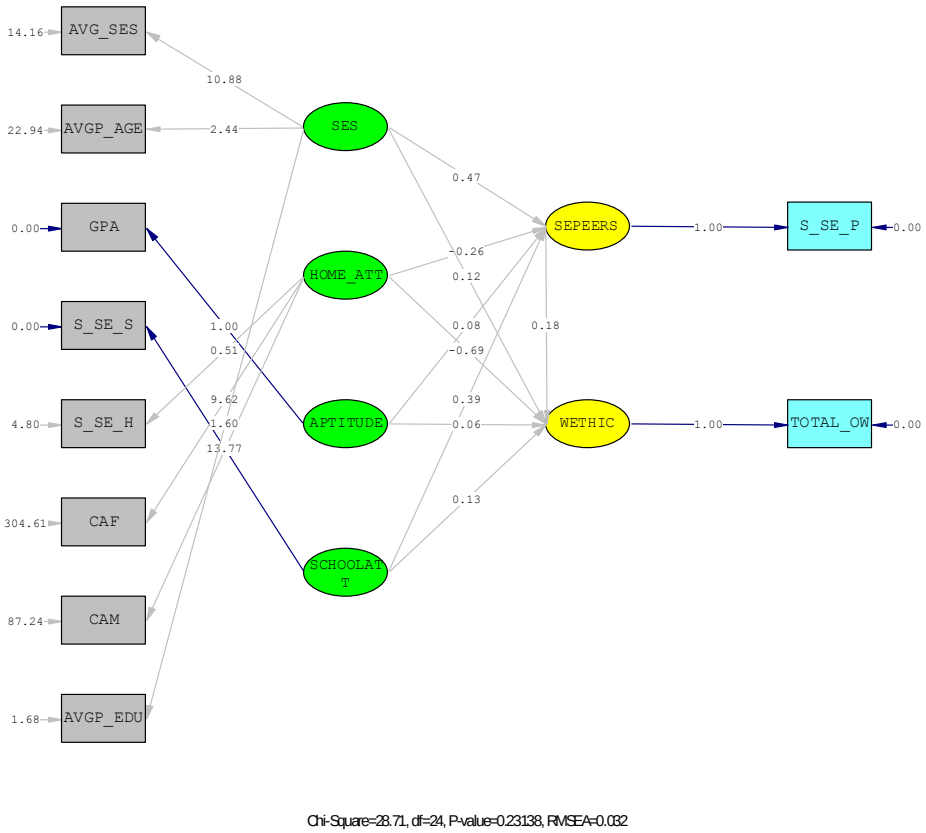
The SIMPLIS syntax file for the theoretical model above is shown in the image below.

STUDENTS.SPL

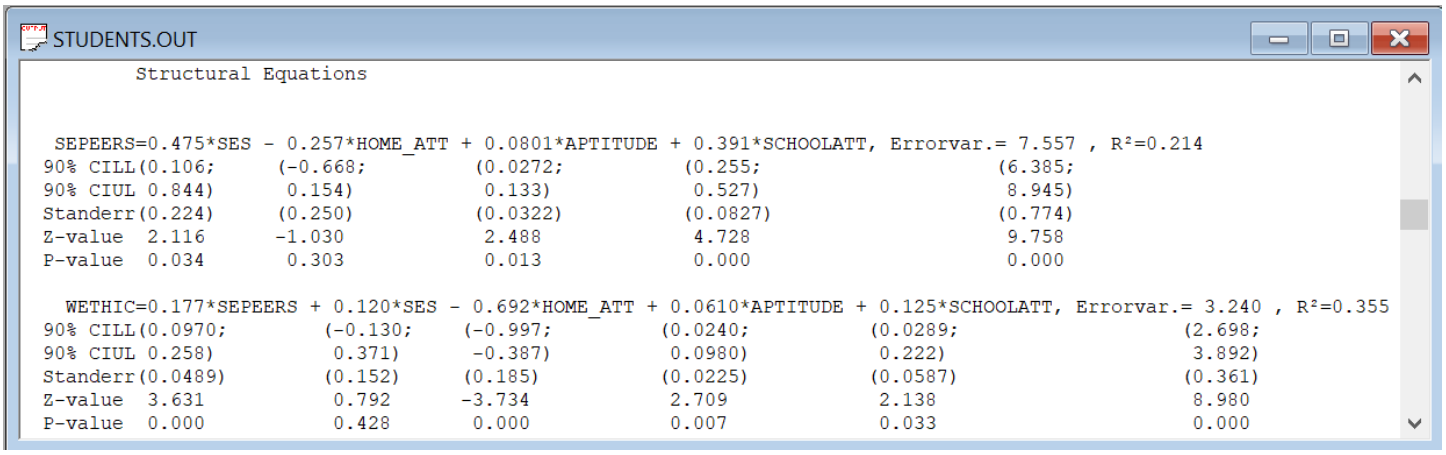
```
Raw Data From File STUDENTS.LSF
Latent Variables
SES HOME_ATT APTITUDE SCHOOLATT SEPEERS WETHIC
Relationships
AVG_SES AVGP_AGE AVGP_EDU = SES
S_SE_H CAF CAM = HOME_ATT
GPA = 1*APTITUDE
S_SE_S = 1*SCHOOLATT
S_SE_P = 1*SEPEERS
TOTAL_OW = 1*WETHIC
Set the Error Variance of GPA to 0.0
Set the Error Variance of S_SE_S to 0.0
Set the Error Variance of S_SE_P to 0.0
Set the Error Variance of TOTAL_OW to 0.0
SEPEERS = HOME_ATT SCHOOLATT APTITUDE SES
WETHIC = SEPEERS HOME_ATT SCHOOLATT APTITUDE SES
Options: SS SC
Path Diagram
End of Problem
```

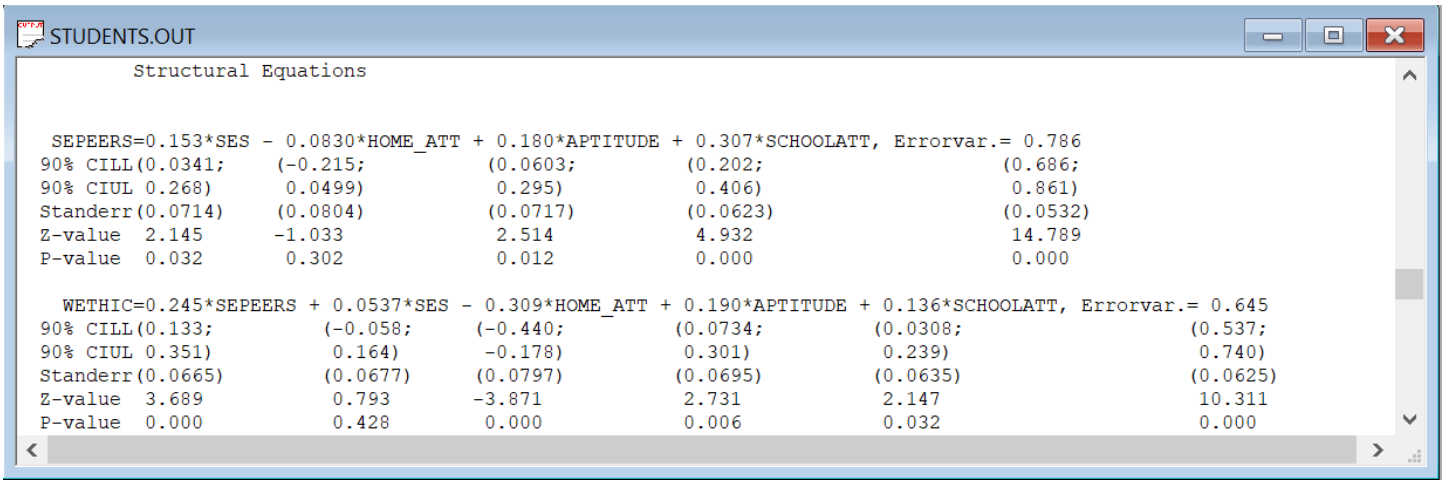
- Line 1 specifies data file to be used.
- Lines 2 to 3 specify the labels for the latent variables of the model.
- Lines 4 to 16 specify the model to be fitted to the data.
- Line 17 requests the standardized and completely standardized solutions.
- Line 18 requests a path diagram of the model.
- Line 19 indicates that no more SIMPLIS commands are to be processed.

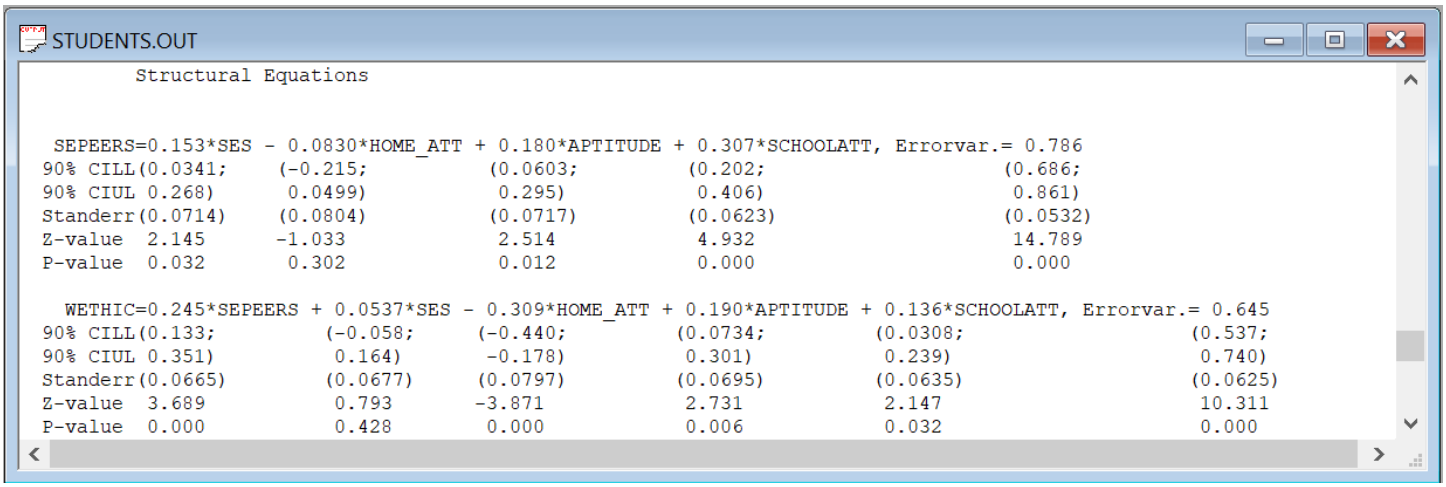
If the SPL file is opened in LISREL and the **Run LISREL** icon is clicked, the following path diagram is obtained.



The corresponding output file, **STUDENTS.OUT**, is opened in a separate window. The confidence interval estimates of the structural equation model parameters for the unstandardized solution, the standardized solution, and the completely standardized solution, which are listed in this file, are shown in the images below.







Note that the confidence interval estimates for the standardized and completely standardized solutions are identical since the variances of all the latent variables of the model are scaled to be equal to unity for both solutions. However, the confidence interval estimates of the parameters of the measurement model of the standardized and completely standardized solutions differ since the variances of the observed variables are not scaled for the standardized solution but are scaled to be equal to unity for the completely standardized solution.