

**Students' Behavioral Engagement:
Measurement Model Validation and Invariance
Across Students' Academic Majors**

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What is students' behavioral engagement?

Behavior expressing involvement in activities, responsibility, interaction with others, and participation actively in classroom and school activities

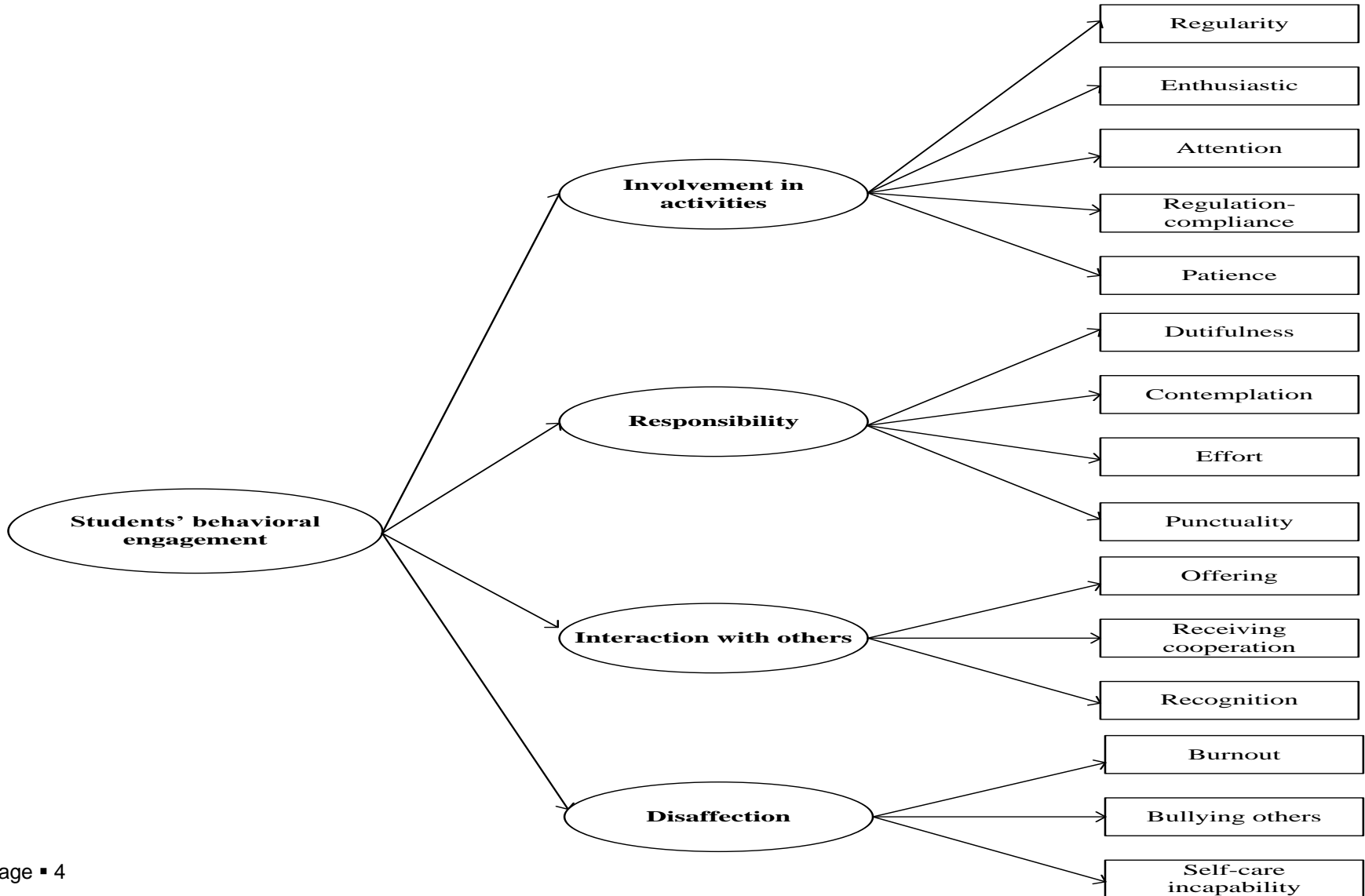
An important factor affecting students' efforts in classroom activities, their achievement and schooling success and failure.

Positive classroom behaviors or functions and undesirable behaviors or disaffection

Students' Behavioral Engagement from Literatures

<p><i>Responsibility</i> Planning, Task management, and effort</p>	<p><i>Irresponsibility</i> Burnout, Task ignorer, and Disengagement</p>
<p><i>Involvement in activities</i> Involvement in classroom and school activities, Regulation-compliance, Patience, and Attention</p>	<p><i>undesirable behavior</i> undesirable behavior and Self-care incapability</p>
<p><i>Interaction with others</i> Offering, Receiving cooperation, and Recognition</p>	<p><i>Bullying others</i> Bullying others and misbehavior</p>

Research Framework

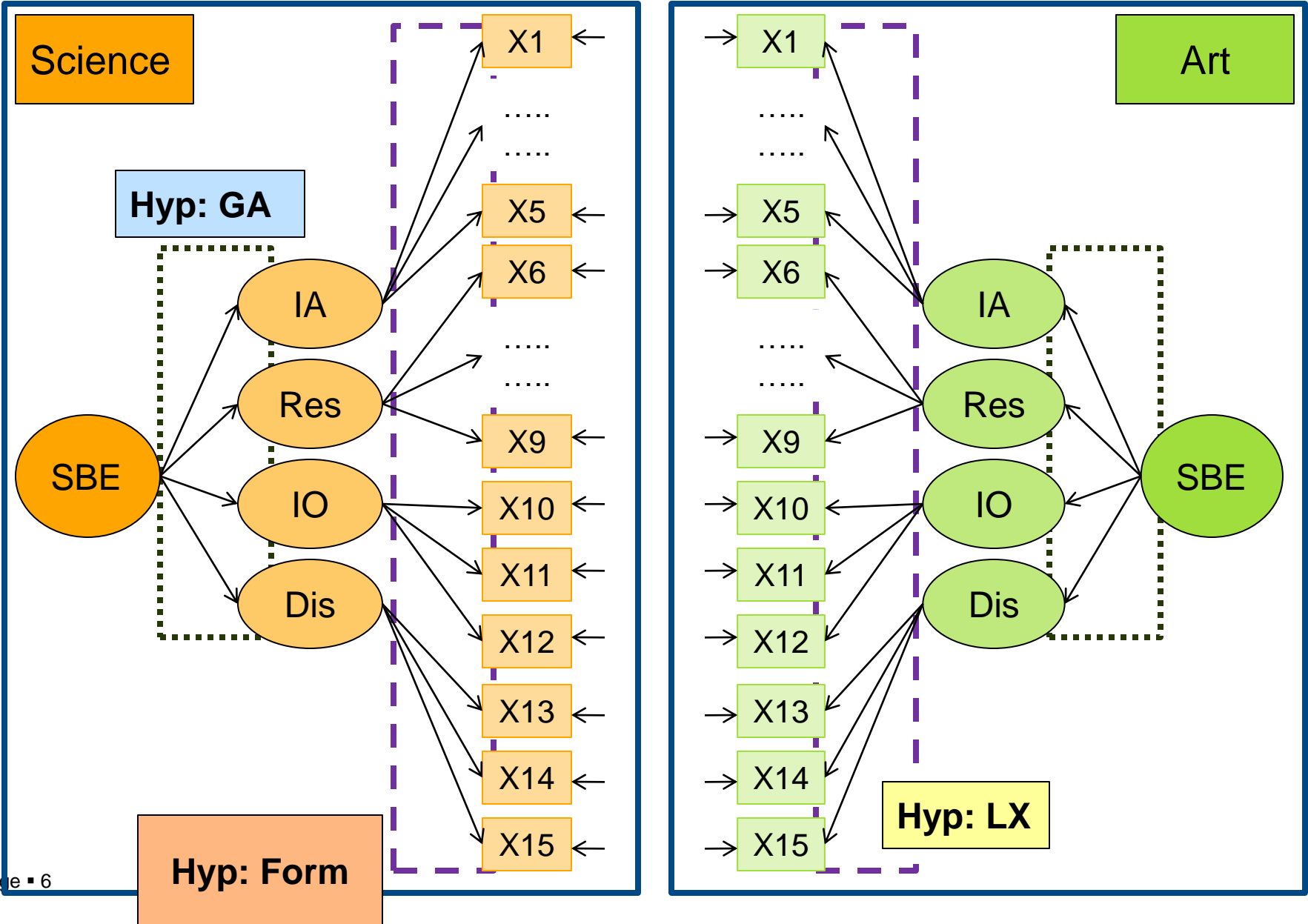


Research Objectives

1) to develop and validate of the measurement model of students' behavioral engagement

2) to study the invariance of the measurement model of students' behavioral engagement across students' academic majors.

Model Invariant Hypotheses

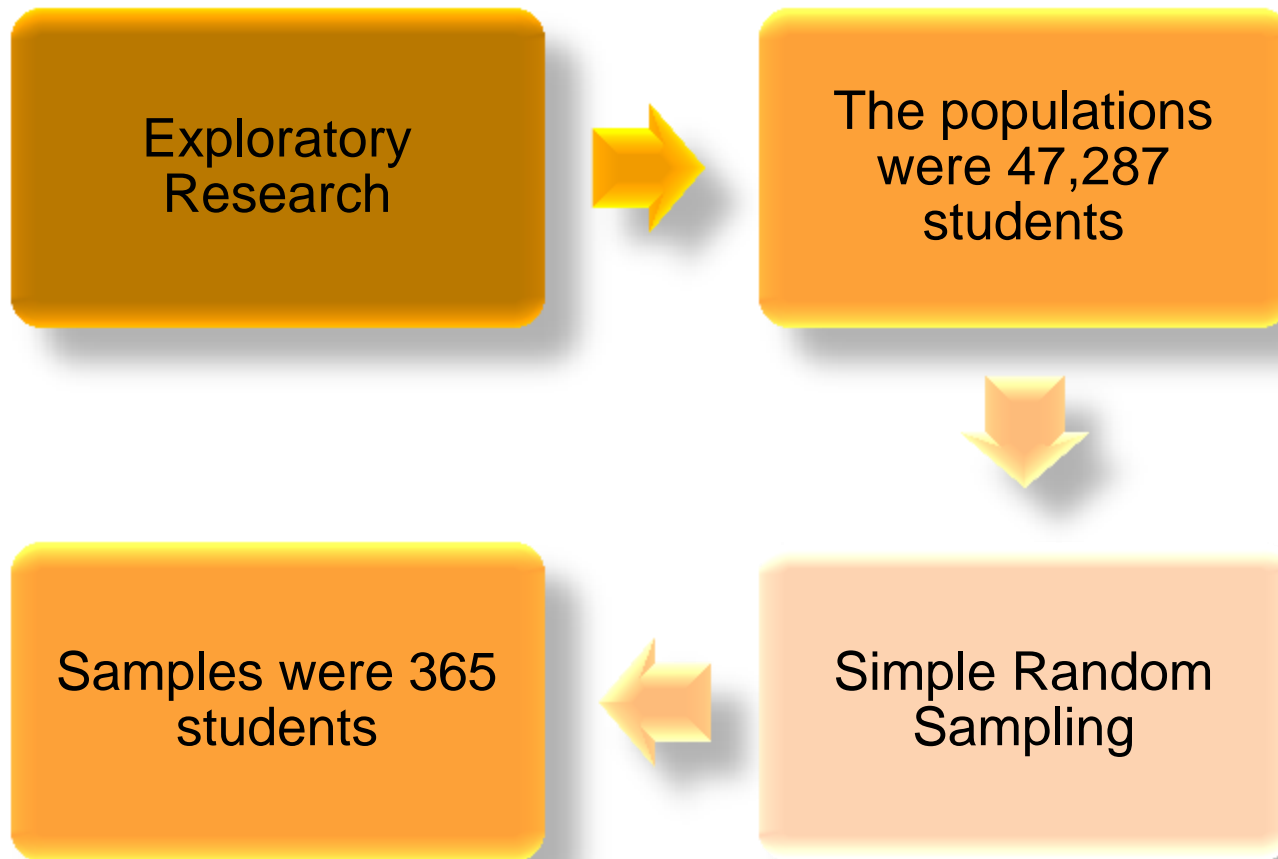


Scope of Research

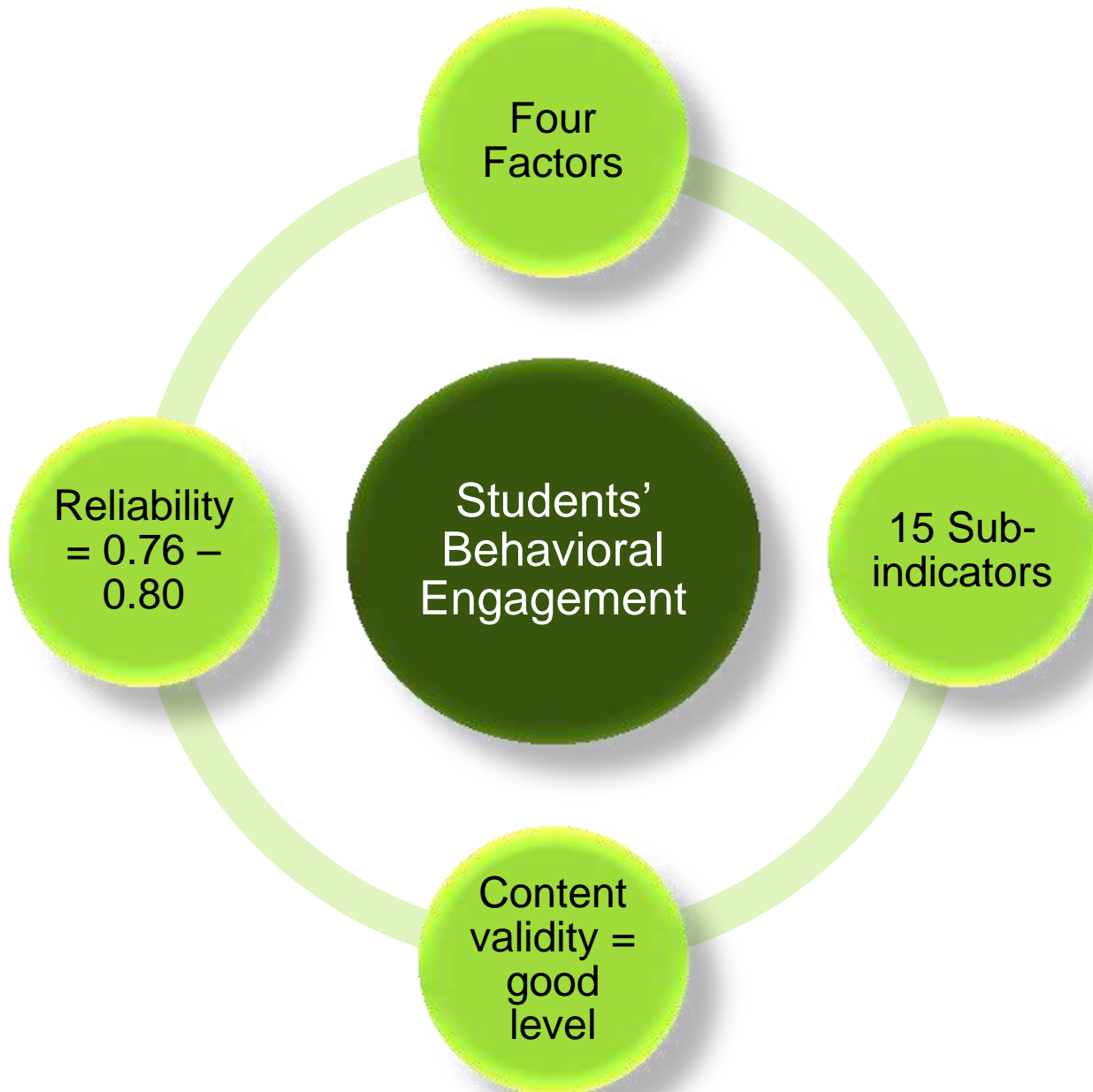
1) academic majors: science and arts

2) Mathayom Suksa Six students (12th Grade) in Bangkok

Research Method



Research Instruments



Data analysis

Content validity and reliability of the model were tested using SPSS.

Structural validity was analyzed using second-order confirmatory factors analysis (CFA) by the Lisrel 8.72 program.

Model invariance was tested using multiple group structural equation models by the Lisrel 8.72 program.

Samples

Figure 3 percentage of students' gender
(n = 365)

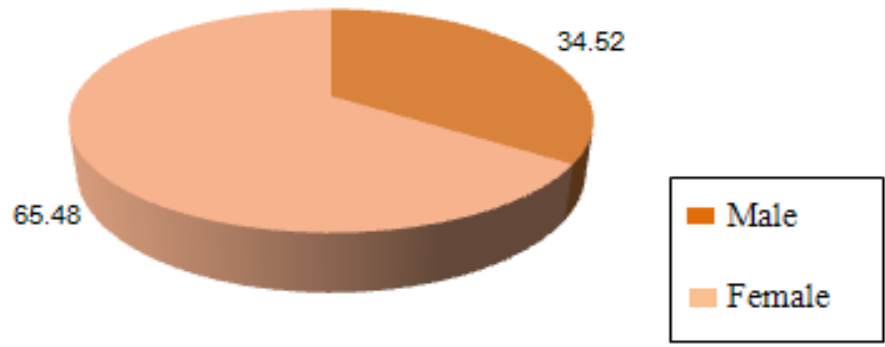


Figure 4 percentage of students' academic majors
(n = 365)

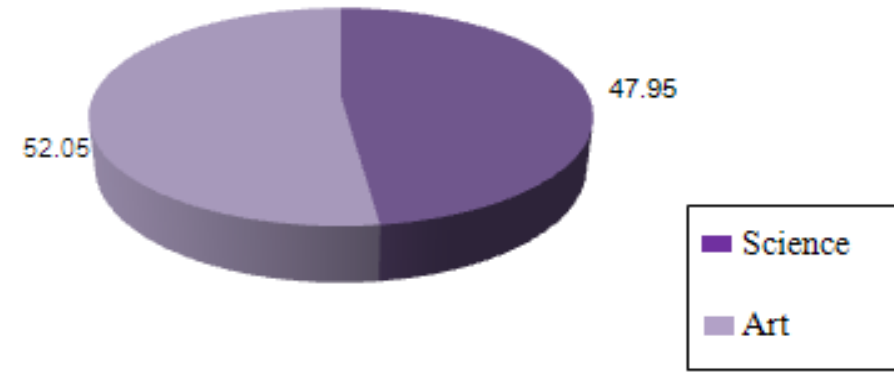
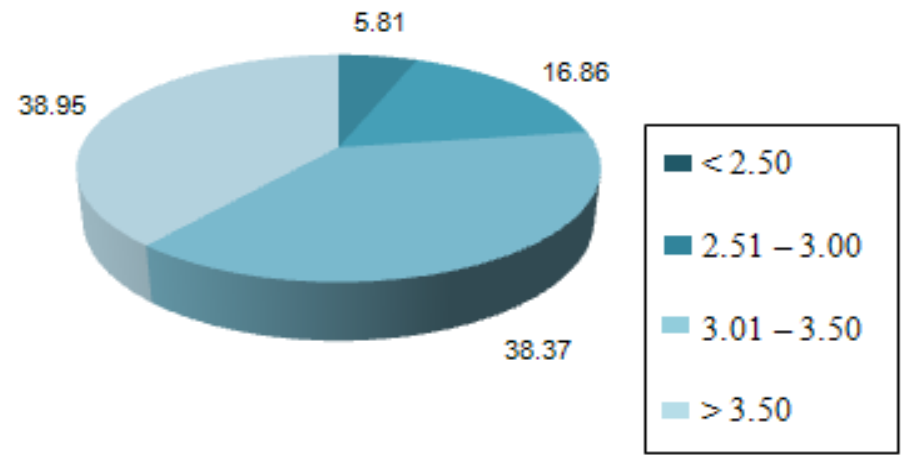


Figure 5 percentage of students' GPA
(n = 365)



Results

- 1) Descriptive and correlations of indicators in the measurement model
- 2) Validation of measurement model of students' behavioral engagement
- 3) Measurement model invariance across students' academic majors

Result 1

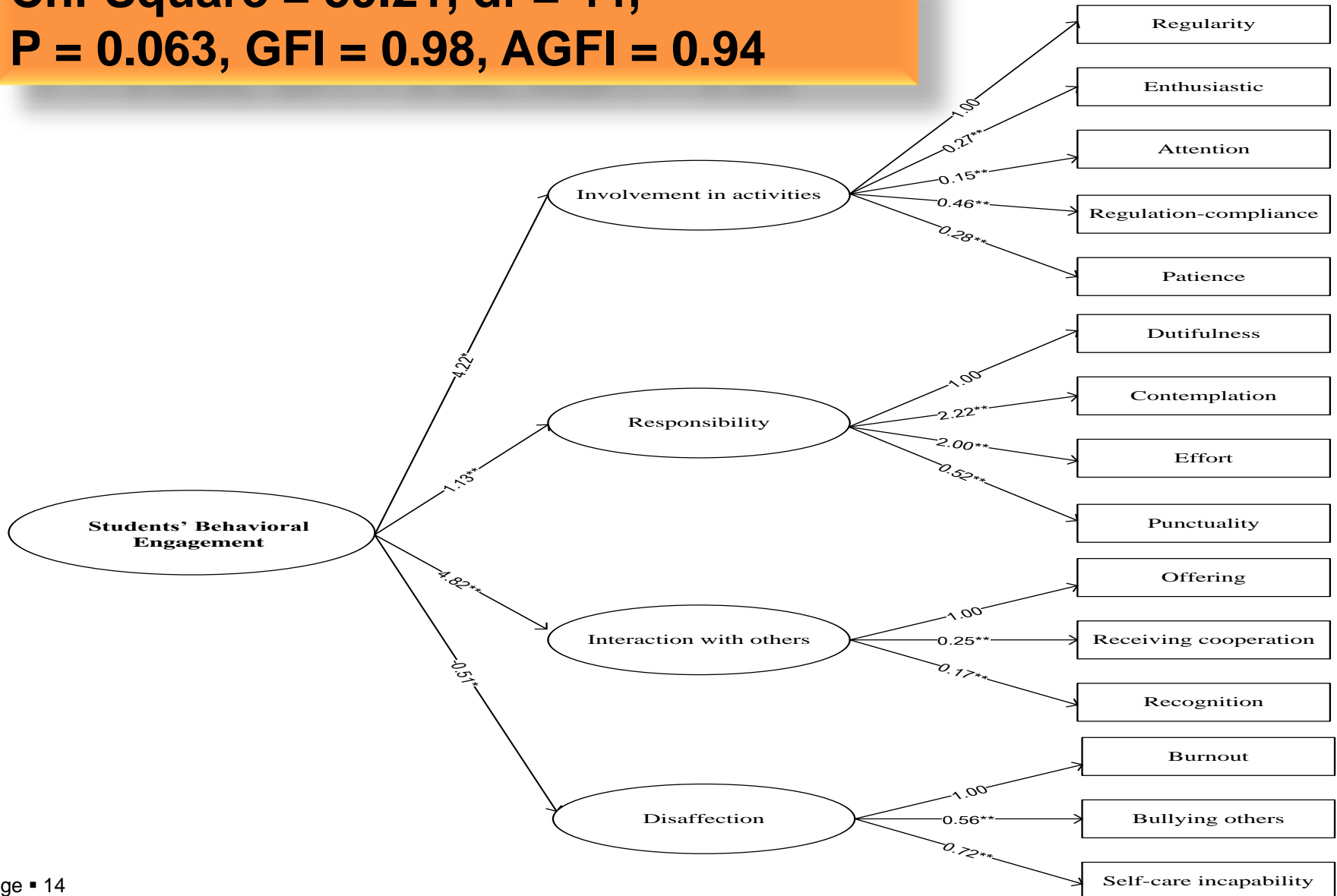
Table | Descriptive and Correlations of Indicators

	II-1	II-2	II-3	II-4	II-5	I2-1	I2-2	I2-3	I2-4	I3-1	I3-2	I3-3	I4-1	I4-2	I4-3
II-1	0.89														
II-2	0.49*	0.90													
II-3	0.55*	0.51*	0.86												
II-4	0.33*	0.28*	0.25*	0.90											
II-5	0.36*	0.29*	0.36*	0.47*	0.90										
I2-1	0.45*	0.37*	0.48*	0.36*	0.43*	0.92									
I2-2	0.29*	0.29*	0.21*	0.35*	0.42*	0.46*	0.90								
I2-3	0.45*	0.43*	0.45*	0.29*	0.41*	0.50*	0.42*	0.91							
I2-4	0.29*	0.15*	0.24*	0.28*	0.27*	0.31*	0.33*	0.25*	0.91						
I3-1	0.28*	0.30*	0.23*	0.37*	0.46*	0.38*	0.46*	0.44*	0.22*	0.90					
I3-2	0.16*	0.24*	0.31*	0.20*	0.21*	0.23*	0.23*	0.29*	0.11*	0.29*	0.85				
I3-3	0.35*	0.42*	0.42*	0.34*	0.42*	0.39*	0.35*	0.37*	0.14*	0.41*	0.39*	0.89			
I4-1	0.01	0.12*	0.09	-0.22*	-0.08	-0.05	-0.23*	-0.07	-0.13*	-0.17*	-0.03	0.05	0.78		
I4-2	-0.02	0.12*	0.08	-0.22*	-0.18*	-0.09	-0.23*	-0.01	-0.17*	-0.20*	0.03	0.02	0.55*	0.69	
I4-3	0.02	0.08	0.01	-0.12*	-0.10	-0.09	-0.20*	-0.06	-0.14*	-0.11*	-0.03	-0.06	0.50*	0.65*	0.68
N	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Mean	2.63	2.51	2.49	3.09	2.89	2.74	3.07	2.79	2.77	3.02	2.87	2.66	1.82	1.78	1.89
SD.	0.52	0.62	0.59	0.65	0.63	0.57	0.61	0.58	0.52	0.56	0.80	0.61	0.92	0.71	0.74

K.M.O. = 0.866, Bartlett's Test of Sphericity: Approx. Chi-Square = 1833.34, df = 105, sig = 0.00

Result 2

**Chi-Square = 59.21, df = 44,
P = 0.063, GFI = 0.98, AGFI = 0.94**



Result 3

Measurement model invariance across students' academic majors

Hypothesis	χ^2	df	p	$\Delta\chi^2$	Δ df	Critical Area	Summary
1. Form invariance	81.27	78	0.377	-	-	-	the invariance of form of measurement model
2. GA invariance	85.16	82	0.384	0.8	1	3.841	the invariance of factor loadings in 4 indicators
3. PS invariance	175.71	88	0.000	90.55	6	12.592	-
4. LX invariance	283.14	99	0.000	107.43	11	19.675	-
5. TE invariance	1084.40	159	0.000	801.26	60	79.082	-

Discussion

1) Indicators of the fourth factor (disaffection) were negative resulting in negative relation.

2) The model had invariance of factors of the measurement model and weight of the four factors.



Recommendations

Implications

Research in the future



Thank You
for Your Attention