Exploring Motivation & Volition for Adults in Non-traditional Learning Environments

Jason Bryer, University at Albany

Laurie Nagelsmith, Excelsior College

AERA – April 15, 2009

Abstract

The purpose of this study was to identify the best fitting model to represent interrelationships between motivation, volition, academic success and persistence for adult nursing students learning in non-traditional environments. Participants (N=297) completed a survey that incorporated two measures, the MSL-Q and AVSI as well as demographic information. Exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) were used for the data analysis. In phase-one, EFA resulted in factors that generally aligned with previous theoretical factors as defined by the psychometrics used. In phase-two of the analysis, CFA validated the use of pre-defined factor structures. The third phase using SEM analysis revealed that motivation accounts for 28% of variance in GPA ($\hat{\beta} = .28; p < .001$) and volition accounts for 15% of variance in GPA ($\hat{\beta} = .15; p < .05$). There was also covariance between motivation and volition (*r*=.42, *p<.001*). These results suggest that there is a significant relationship among motivation, volition, and academic success for adult learners studying in non-traditional learning environments. These findings are consistent with and elaborate the relationship between motivation and volition with a population and setting underrepresented in the research.

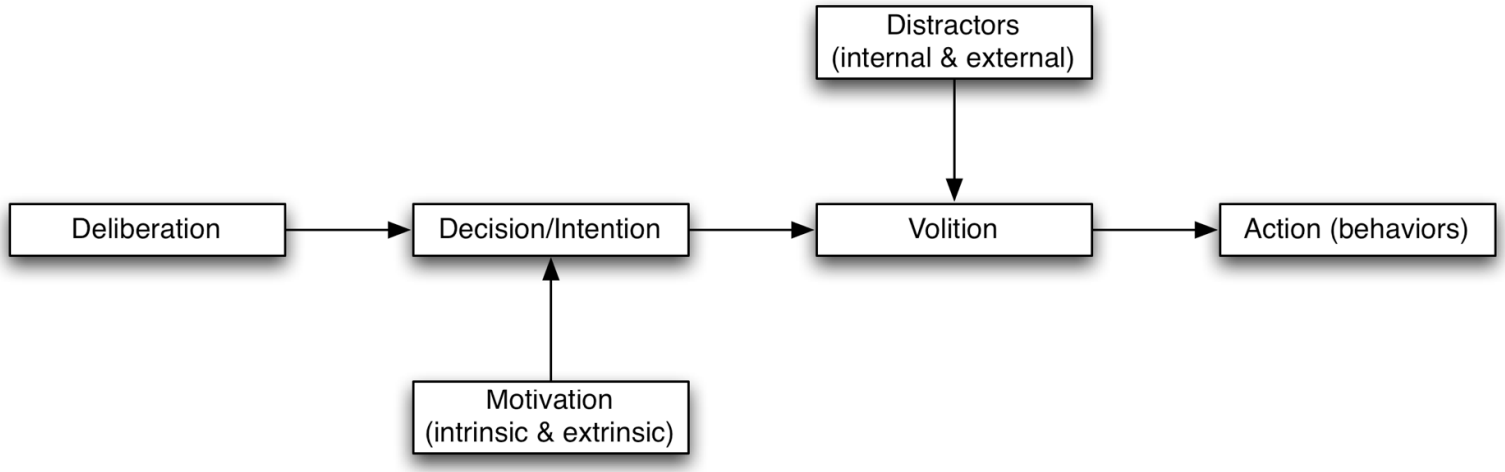
Objectives

- Examine the validity of the MSL-Q and AVSI for adult students in a non-traditional learning environment.
- Identify the relationships among motivation, volition, and academic success.

Why?

- There is a paucity of research specific to the academic success of adult nursing students studying outside of a classroom setting or an apprenticeship model of education.
- The relationship (or distinction) between motivation and volition is primarily theoretical and is not sufficiently elaborated.

Initial Theoretical Model



- Motivation: (Latin root of motive means to move). Achievement striving, including goal setting. Rich history of motivational research in education (Weiner, 1990).

- Volition: the skill and will that keeps actions focused on set goals despite distracters, such as competing desires and priorities. Strategy use and goal attainment (persistence) are indicators of volition. It is the post-decisional facet of volition that distinguishes it from motivation.

Method

- Survey of adult nursing students enrolled in online baccalaureate program (*N*=297). Survey contained questions from:
  - Motivated Strategies for Learning Questionnaire (MSL-Q); 31 items
  - Academic Volitional Strategy Inventory (AVSI); 20 items
  - Demographics
- Academic measures include overall GPA as well as core, general, and nursing component GPA.
- Persistence measured by student status (i.e. enrolled, withdraw, graduated) and months enrolled.

Categorical Variable

Variable		Frequency	Percentage
Race			
	Black or African American	25	8.3
	White American	249	82.5
	Hispanic or Latino	5	1.7
	American Indian or Alaskan	0	0
Native			
	Asian	6	2.0
	Native Hawaiian or Pacific	0	0
Islander			
	Multiracial	5	1.7
	Other	12	4.0
Gender			
	Male	42	13.9
	Female	260	86.1
Household Income			
	<$20,000	1	.3
	$20,000 – $39,999	5	1.7
	$40,000 – $59,999	53	17.5
	$60,000 – $79,999	80	26.5
	$80,000 – $99,999	58	19.2
	>$100,000	105	34.8
Status			
	Enrolled	183	61.4
	Withdrawn	51	17.1
	Graduated	64	21.4

Continuous Variables

Variable	*N*	Min	Max	Median	Mean	SD
Age (in months)	297	288	973	563	561	98.5
Total GPA	302	2.0	4.0	3.21	3.15	.39
General Ed GPA	296	2.0	4.0	3.22	3.18	.42
Core GPA	296	2.0	4.0	3.12	3.14	.51
Nursing GPA	227	1.85	4.0	3.0	3.03	.54
Examination Scores						
Management in Nursing	103	46	79	64	63.85	7.00
Research in Nursing	151	24	96	70	69.30	12.22
Community Health Nursing	97	-1.17	1.22	.1387	.1639	.4254
Enrollment (in months)	297	14	348	46	61.44	52.88

Analysis

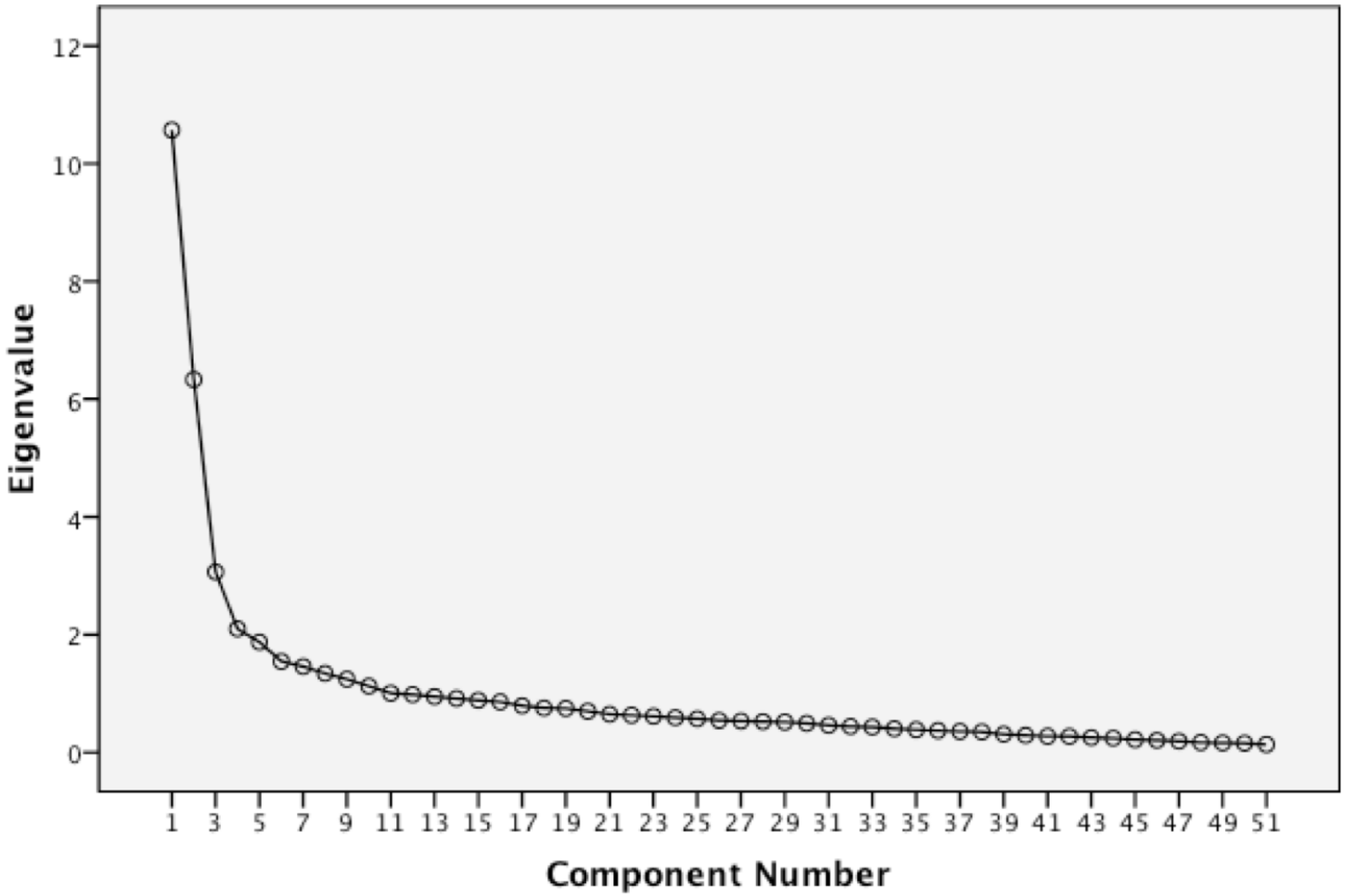
1. Exploratory Factor Analysis[a]
2. Confirmatory Factor Analysis[b]
3. Structural Model Analysis[b]

[a] Analysis completed using SPSS®
[b] Analysis completed using AMOS®

Exploratory Factor Analysis

- Exploratory factor analysis to identify underlying latent factors. Maximum likelihood estimation, rotated, yielded six factors.

EFA: Scree Plot



Structural Equation Modeling (SEM)

- SEM consists of two components:
  - Measurement model (i.e. confirmatory factor analysis) – Defines the relationship between observed and unobserved variables.
  - Structural model (i.e. model describing how latent variables predict other latent variables) – Defines relations among unobserved variables.

SEM Definitions

- Measured variables – directly observed variables such as gender, race, survey items, etc.
- Latent variables – unobserved variables or constructs
- Exogenous – synonymous with independent variables
- Endogenous – synonymous with dependent variables
- Direct effects – effects determined by theory or logic.
- Indirect effects – mediating and moderating effects

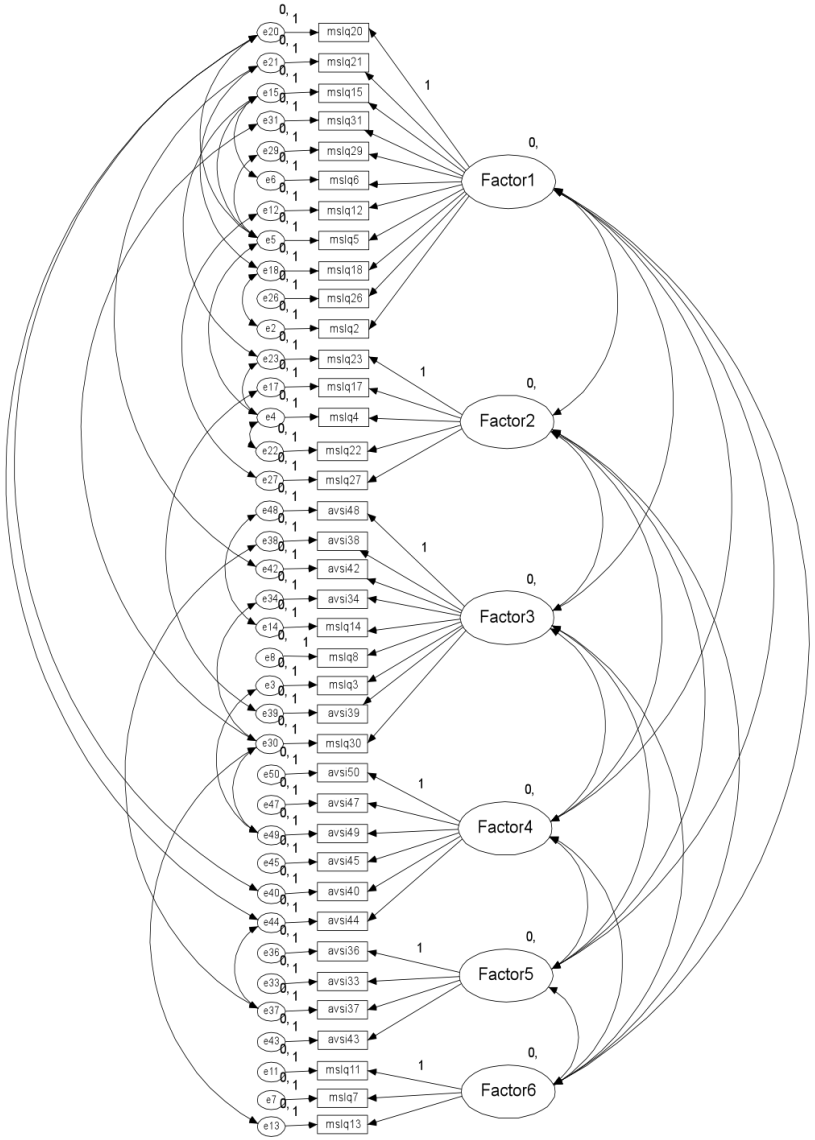
Confirmatory Models

- Based upon our exploratory factor analysis (EFA) as well as the MSL-Q and AVSI manuals, we end up with four potential measurement models.
  - 6-factor model
  - AVSI model
  - MSL-Q model
  - Composite model

Exploratory Factor Analysis

Predefined Factors by measurement authors

6-Factor Model (EFA)

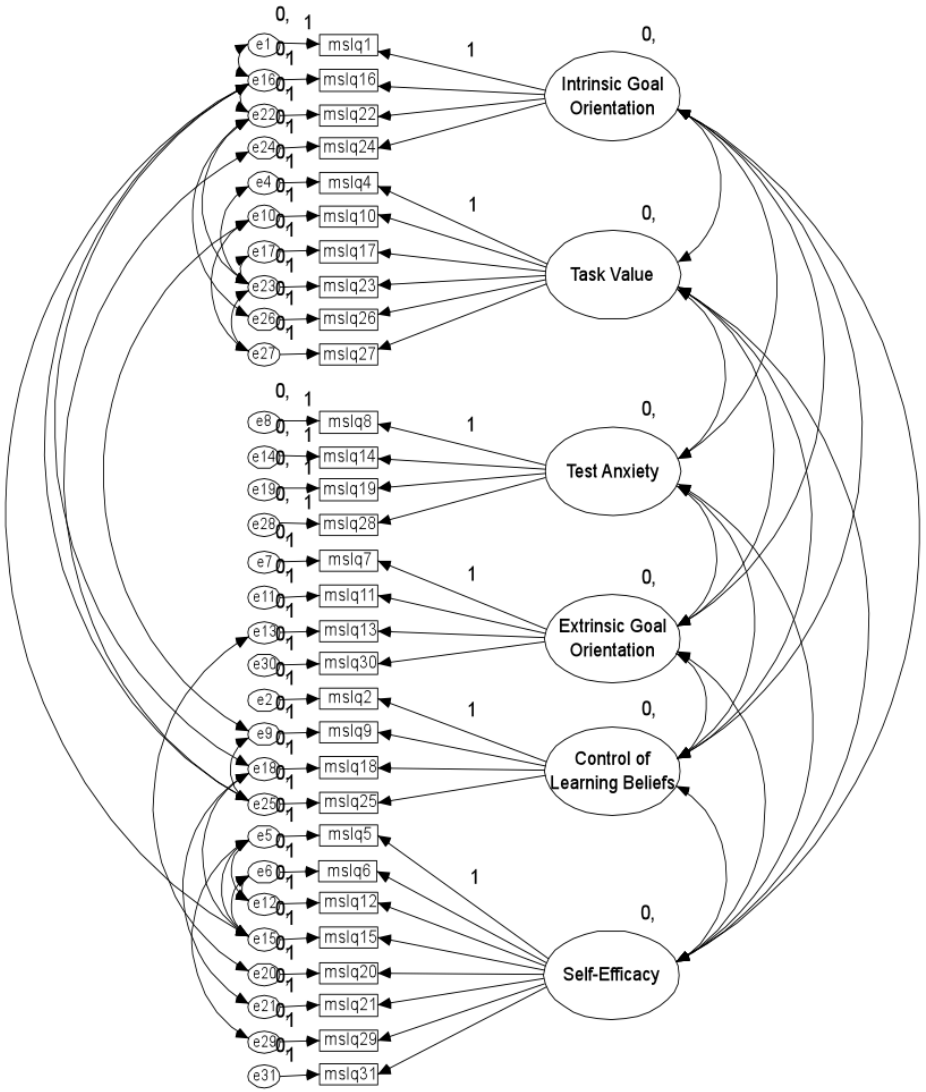


- Factor 1=Self-efficacy (MSL-Q: EC)
- Factor 2=Task value (MSL-Q: VC)
- Factor 3=Negative-based incentives (AVSI)
- Factor 4=Stress reducing actions (AVSI)
- Factor 5=Self-efficacy enhancements (AVSI)
- Factor 6=External goal orientation (MSL-Q: VC)

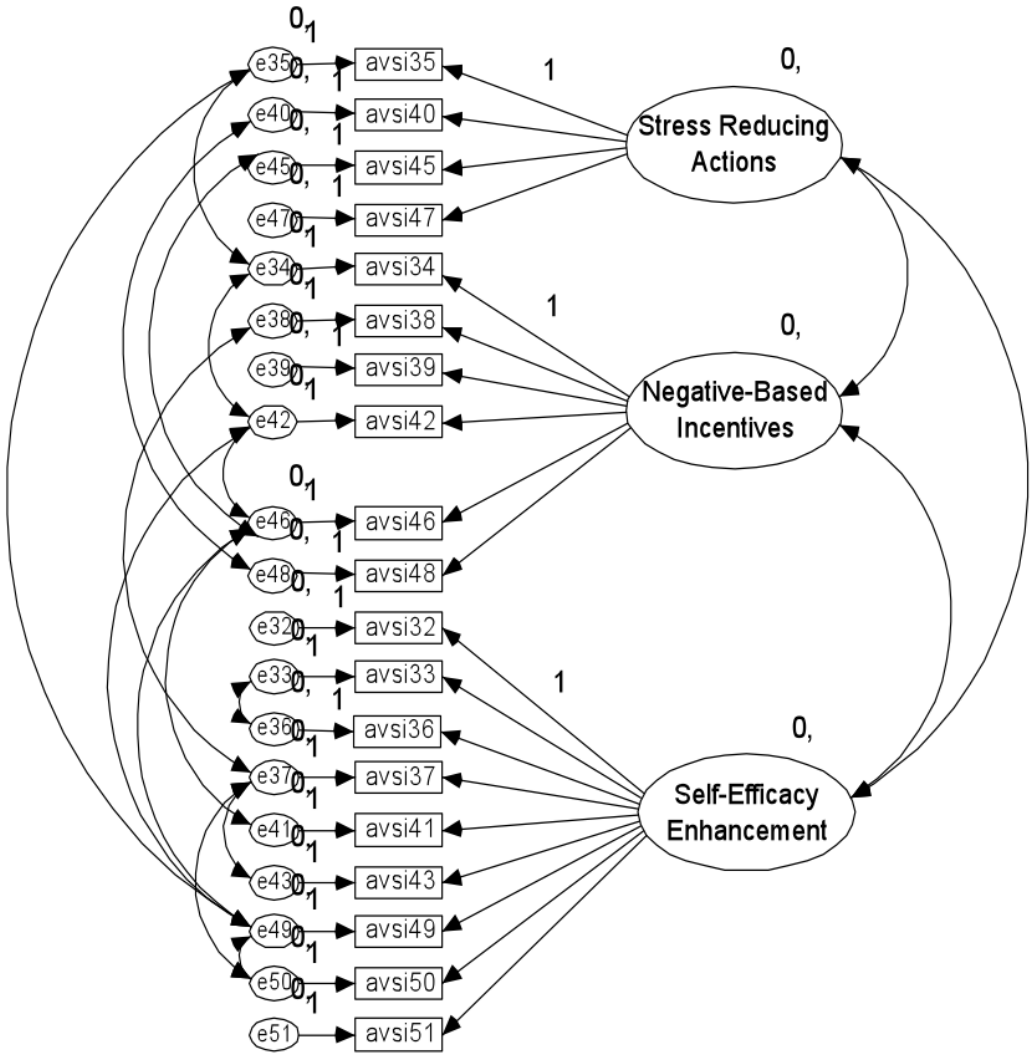
EFA Conclusions

- Though ultimately we don't use either of the factor models from our exploratory factor analysis, it should be noted that:
  - Factors defined by EFA tend to align with the factors defined by the measurements.

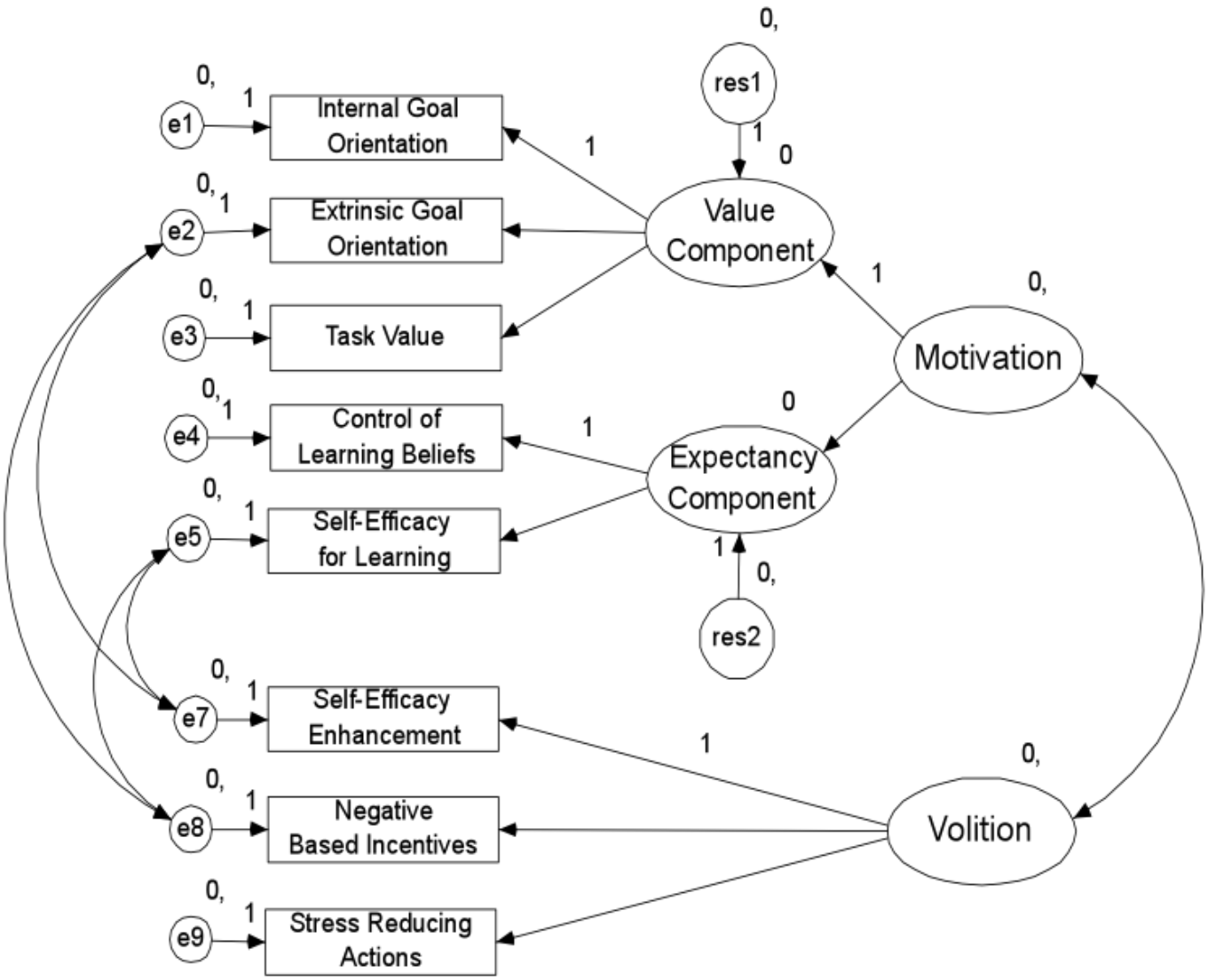
MSL-Q Model


Intrinsic Goal Orientation
Task Value
Test Anxiety
Extrinsic Goal Orientation
Control of Learning Beliefs
Self-Efficacy
mslq1
mslq16
mslq22
mslq24
mslq4
mslq10
mslq17
mslq23
mslq26
mslq27
mslq8
mslq14
mslq19
mslq28
mslq7
mslq11
mslq13
mslq30
mslq2
mslq9
mslq18
mslq25
mslq5
mslq6
mslq12
mslq15
mslq20
mslq21
mslq29
mslq31

AVSI Model


Stress Reducing Actions
Negative-Based Incentives
Self-Efficacy Enhancement
avsi35
avsi40
avsi45
avsi47
avsi34
avsi38
avsi39
avsi42
avsi46
avsi48
avsi32
avsi33
avsi36
avsi37
avsi41
avsi43
avsi49
avsi50
avsi51
e35
e40
e45
e47
e34
e38
e39
e42
e46
e48
e32
e33
e36
e37
e41
e43
e49
e50
e51
1
0,

Composite Model

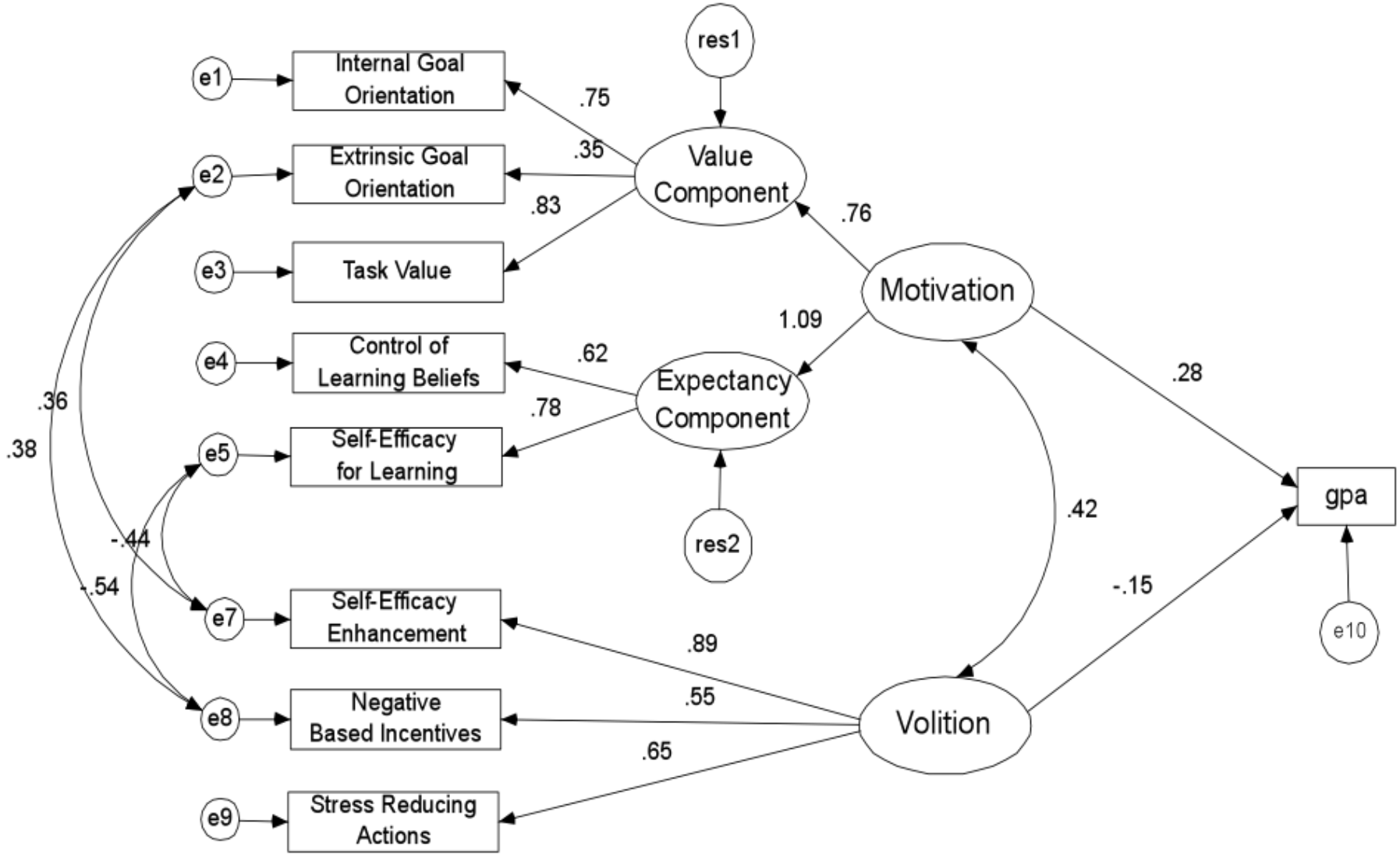


Model Fit Statistics

- Performed confirmatory factor analysis of the three-factor, six-factor, as well as MSL-Q and AVSI defined factor models.

	Target	*6-factor*	*MSL-Q*	*AVSI*	*Composite*
χ^2	$\geq .05$	1238.88	697.0	273.6	16.6
df		627	368	135	12
χ^2/df	< 5	1.976	1.894	2.027	1.382
TLI	$\geq .90$	.866	.913	.868	.985
CFI	$\geq .90$	.880	.926	.896	.994
RMSEA	$\leq .06$	.057	.055	.059	.036

Structural Model



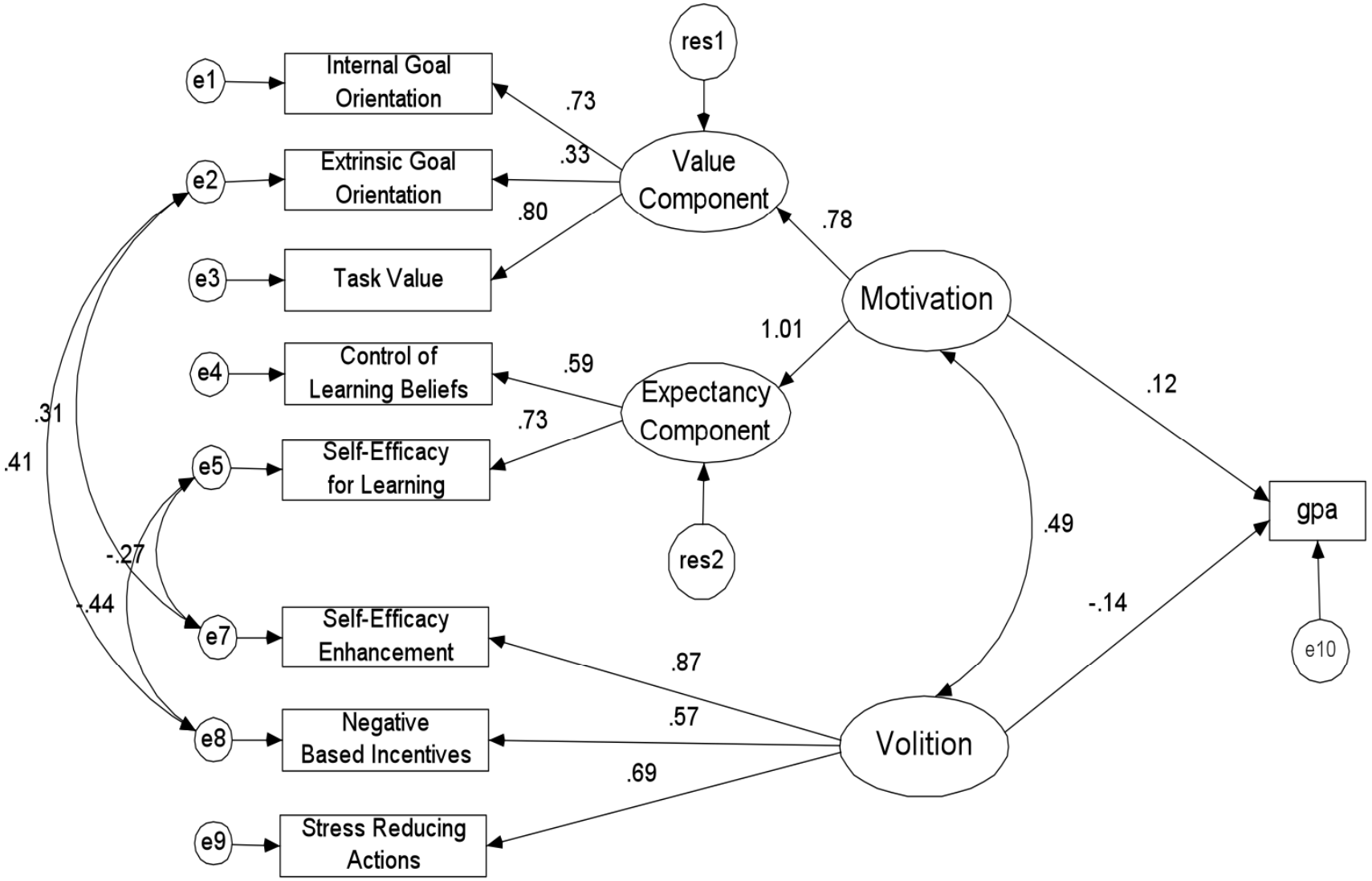
Results

- The model yielded a χ^2 value of 38.402, with 19 *df*. Model fit indices for TLI, CFI, and RMSEA are .951, .974, and .059, respectively.
- Motivation and volition covary (*r*=.42, *p<.001*).
- Motivation accounts for 28% of the variance in GPA ($\hat{\beta} = .28; p < .001$).
- Volition accounts for 15% of the variance in GPA ($\hat{\beta} = .15; p < .05$).

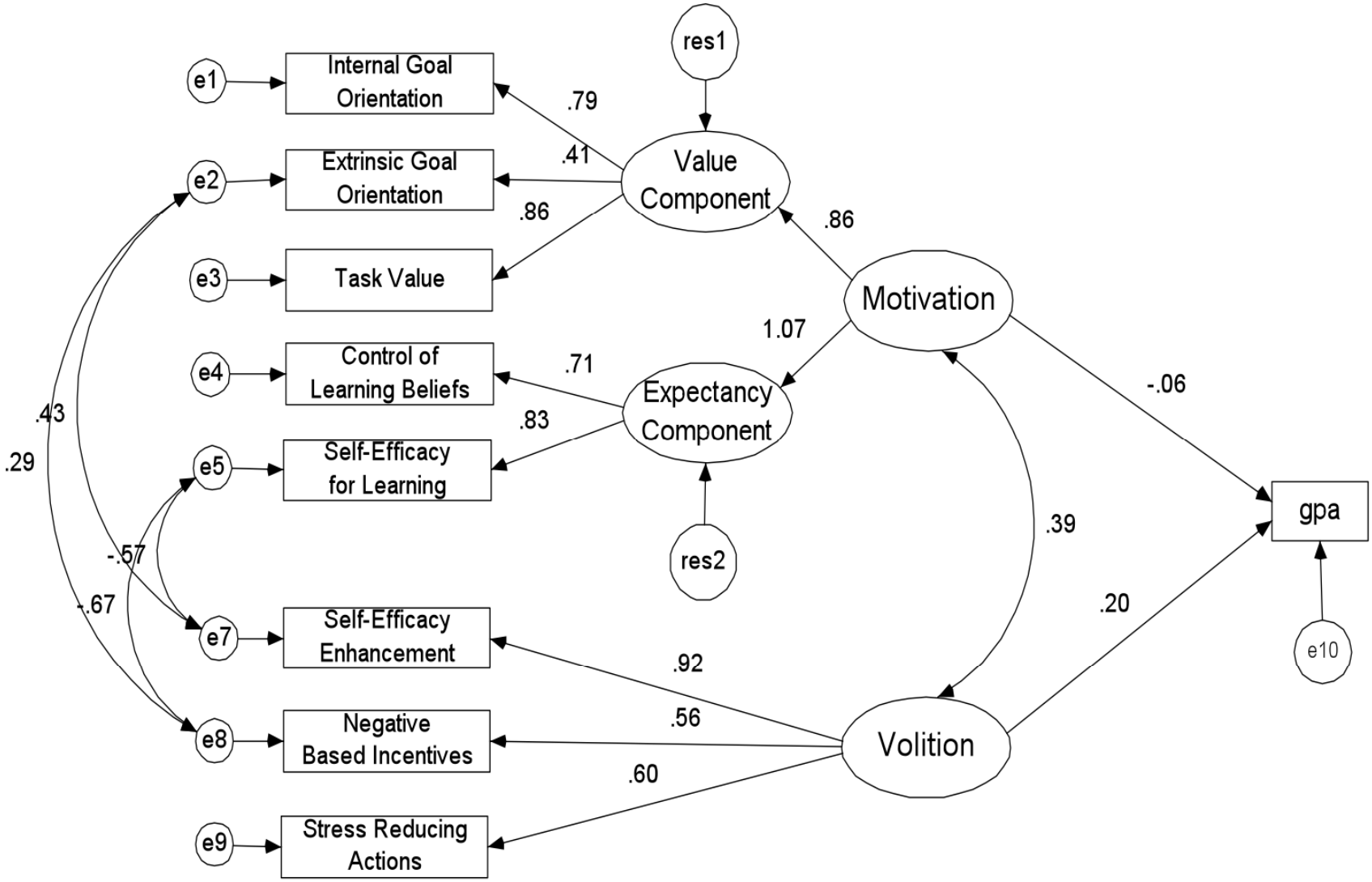
Subgroup Analysis

- Multiple group analysis were performed to determine the influence of categorical variables (e.g. gender, race, student status).
- Results suggest there may be an inverse relationship between motivation & volitional strategy use based upon achievement.
    - Perhaps due to sample size of comparison groups, statistical significance for all path coefficients was not achieved.
    - Further investigation is necessary.

High Achieving Students



Low Achieving Students



Thank You

jason@bryer.org
lnagelsmith@excelsior.edu

References

Bolan, K. A. (1989). *Structural equations with latent variables.* New York: Wiley.

Byrne, B. M. (2001). Structural equation modeling with AMOS: Basic concepts, applications, and programming. Mahwah, NJ: Lawrence Erlbaum Associates.

Fabrigar, L. R., Wegener, D. T., MacCallum, R.C., & Stahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299.

Mulaik, S. A., & Millsap, R. E. (2000). Doing the four-step right. *Structural Equation Modeling, 7*(1), 36-73.

Pruzek, R. M. (2005). Factor analysis: Exploratory. In B. S. Everitt & D. C. Howell (Eds.). Encyclopedia of Statistics in Behavioral Science (vol. 2, pp. 606-617). Chichester: John Wiley & Sons, Ltd.

Weiner, B. (1990). History of motivational research in education. Journal of Educational Psychology, 82(4), 616-622.