A Meta-Analysis of the Relationship Between Achievement Goal Orientation and Academic Achievement: The Mediating Role of Self-Efficacy and Learning Engagement

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Abstract

Achievement goal orientation constitutes an important factor influencing students'academic achievement. While numerous studies have explored the intrinsic relationship between achievement goal orientation and academic achievement, the magnitude of their correlation, as well as the mediating and moderating mechanisms, remain controversial. Therefore, the present study employs meta-analytic methods to examine the reliability of effect sizes, the mediating effects of self-efficacy and learning engagement, and a series of moderating effects. A total of 67 eligible primary studies were included, comprising 206 effect sizes. The results revealed: (1) Mastery-approach goals and performance-approach goals exhibited significant positive correlations with academic achievement, whereas mastery-avoidance goals and performance-avoidance goals showed significant negative correlations with academic achievement, with each indicator demonstrating a robust weak correlation with academic achievement. (2) The relationship between achievement goal orientation and academic achievement was influenced by age stage and measurement instrument, but was not moderated by gender ratio or achievement type. (3) Self-efficacy and learning engagement served as mediators in the influence of achievement goal orientation on academic achievement; however, the mediating effect of learning engagement was present only in the secondary school group and was not significant in the university group.

Full Text

Preamble

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Introduction

The Fifth Plenary Session of the 19th Central Committee of the Communist Party of China identified the primary task for educational development during the "14th Five-Year Plan" period as building a high-quality education system and comprehensively improving educational quality. Within the current educational system, academic achievement is regarded as a crucial component of educational quality, providing a quantitative assessment of national educational effectiveness. Consequently, enhancing academic achievement has become a focal concern across society. Social cognitive theory posits that individual academic achievement is driven by a combination of internal individual factors and external environmental factors (Lee & Shute, 2010). Among these individual factors, intelligence and non-intellectual factors can be distinguished, with motivation being the most central element among all non-intellectual factors (Jiang Yi, 2022). Achievement goal orientation represents a widely studied motivational variable in educational contexts (Urdan & Schoenfelder, 2006), influencing students' academic achievement trajectories and goal attainment through dynamic psychological processes that articulate how goals impact academic performance (Bardach et al., 2020). Positive achievement goal orientation helps students construct productive academic dispositions, engage in learning activities with high quality, and promotes student development and academic quality improvement.

In recent years, scholars both domestically and internationally have conducted empirical research on the relationship between achievement goal orientation and academic achievement based on achievement motivation theory, primarily examining achievement goal orientation and its sub-dimensions: mastery-approach goals, mastery-avoidance goals, performance-approach goals, and performance-avoidance goals. Furthermore, as developmental psychology has advanced, contemporary academic attention has increasingly focused on the mediating mechanisms through which achievement goal orientation influences academic achievement, encompassing variables such as academic self-concept (Albert & Dahling, 2016) and anxiety (Möcklinghoff et al., 2023). A review of the literature reveals that research has concentrated on examining the effects of non-intellectual factors, particularly self-efficacy (Curelaru et al., 2020; Lu et al., 2022; Ollfors & Andersson, 2022; Hunsu et al., 2023) and learning engagement (Antaramian & Lee, 2017; Guo & Leung, 2021; Luo & Luo, 2022; Wang et al., 2023) on academic achievement. Self-efficacy refers to individuals' belief in their capability to achieve desired goals (Bandura, 1977), determining the level of effort individuals invest and their perseverance in overcoming difficulties, making it a key factor influencing student engagement and academic improvement. Learning engagement refers to the time and effort individuals devote to educationally purposeful activities (Kahu, 2013), serving not only as an important measure

of students' learning capacity but also as a significant proximal predictor of academic achievement.

However, research findings on the association strength between achievement goal orientation and academic achievement have not been unified (Luo et al., 2013; Omer Shehzad, 2019), and the moderating factors affecting this relationship as well as the magnitude of mediating effects remain unresolved (Cakir & Gazioglu, 2021; Karlen et al., 2019; Wilby, 2022; Wirthwein et al., 2013). Therefore, based on Elliot and McGregor' s (2001) classification of achievement goal orientation and integrating achievement goal theory, expectancy-value theory, and self-efficacy theory, this study employs meta-analysis to examine consistencies and discrepancies in existing research, thereby providing a comprehensive report on the correlation magnitude between achievement goal orientation and academic achievement. The study specifically investigates the independent and chain mediating effects of self-efficacy and learning engagement, as well as potential moderating factors, offering evidence and new perspectives for understanding the relationship between educational environments and student development.

Theoretical Background and Research Gaps

Achievement goal orientation serves as a crucial motivational source for learners' goal attainment, influencing academic achievement by affecting cognition, emotion, and motivation processes related to academics (Chen Chen, 2023; Elliot & Murayama, 2008). Examining the relationship between achievement goal orientation and academic achievement not only explains differences in students' cognitive intensity but also reveals internal causes of academic performance differentiation, thereby deepening understanding of the intrinsic mechanisms of student learning processes at a micro level. Consequently, this relationship has gained increasing attention and become a core issue in international cognitive and psychological research (Qian & Lau, 2022). Since the 1980s, research on the relationship between achievement goal orientation and academic achievement has flourished, with most studies supporting a unidirectional influence of achievement goal orientation on academic achievement (Möcklinghoff et al., 2023). Two theories explain this phenomenon: First, behavioral dynamics theory suggests that achievement goal orientation acts as a catalyst for behavior, primarily by stimulating individuals' need-based motivational systems to induce specific learning activities and propel them toward established goals, thereby influencing academic achievement (Kurt Lewin, 2011). Second, achievement goal orientation theory posits that achievement goal orientation represents an internal drive with motivation, primarily by stimulating individuals' perception systems regarding their ability levels, thereby promoting active environmental adaptation and change, effortful difficulty overcoming, and the construction of positive academic dispositions that influence academic achievement (Elliott & Dweck, 1988).

Nevertheless, previous research debates this unidirectional influence. Some stud-

ies have found that approach goals (mastery and performance) enhance students' academic achievement, showing positive correlations (Bubic et al., 2015), while others report negative correlations (Liu et al., 2019) or no relationship (King & McInerney, 2014). Conversely, avoidance goals (mastery and performance) lead to negative learning outcomes and negatively correlate with academic achievement (Zhou et al., 2019), though some studies report positive correlations (Kennedy & Tuckman, 2013) or no relationship (Elliot & McGregor, 2001). These divergent conclusions render the relationship between achievement goal orientation and academic achievement uncertain. For the entire field, any single study represents a result based on researchers' individualized designs and sample estimates, which may deviate from the overall population situation (Jin Juanjuan et al., 2023). Therefore, discrepancies in empirical research conclusions may relate to differences in sample characteristics (e.g., age stage, gender ratio) and study characteristics (e.g., measurement tools, achievement types) selected by different researchers.

First, regarding sample characteristics, although achievement goal orientation occurs throughout the lifespan, its relationship with academic achievement is more pronounced in younger than older age groups (Đuranović, 2019). Existing research often focuses on specific age stages (Los & Schweinle, 2019; Wang et al., 2023), and the effects of achievement goal orientation on academic achievement may vary across age stages. Additionally, from the perspective of gender role trait differences, males and females differ in their thinking extensions regarding achievement goal orientation, with females more likely than males to develop positive academic dispositions (Diaconu-Gherasim et al., 2018). However, to ensure objective investigation, existing research rarely controls gender ratio from a subjective level (Ng, 2017; Zhou et al., 2019), and the effects may differ across varying gender ratios.

Second, regarding study characteristics, achievement goal orientation is a multidimensional theoretical construct with two-factor, three-factor, and four-factor measurement structures. Most existing research relies on single measurement tools (Karlen et al., 2019; Muenks et al., 2018), and effects may differ across measurement tools. Furthermore, academic achievement includes two assessment methods: course examinations and standardized tests, with most existing research based on single test results (Avci & Durak, 2023; Limpo & Alves, 2017). The effects of achievement goal orientation may differ across achievement types. Therefore, it is necessary to integrate literature examining the relationship between achievement goal orientation and academic achievement.

Notably, previous meta-analyses have offered fragmented perspectives on achievement goal orientation, examining only relationships between subdimensions and academic achievement (Baranik et al., 2010). Some studies have positioned achievement goal orientation within the middle structure of motivation and behavior, focusing on associations with its antecedents and consequences (Guo et al., 2023; Richardson et al., 2012), or used academic achievement as one indicator of educational outcomes while focusing on

comprehensive quality levels (Senko & Dawson, 2017). Moreover, existing meta-analyses have not sufficiently explored potential moderators between the four-factor structure of achievement goal orientation and academic achievement. Due to limited literature on mastery-avoidance goals, previous research often grouped them with mastery goals for overall tracking (Huang, 2012; Hulleman et al., 2010). Additionally, current meta-analyses have not deeply investigated the mediating effects of non-intellectual factors between achievement goal orientation and academic achievement, focusing primarily on integrating effect sizes and exploring moderators without incorporating mediating variables (Lochbaum & Gottardy, 2015; Van Yperen et al., 2014). Particularly, meta-analyses based on the four-factor structure model of achievement goal orientation are approximately ten years old, potentially suffering from time-lag bias. Therefore, it is necessary to employ meta-analysis to integrate current research findings from a more macroscopic perspective to confirm the strength, mediating mechanisms, and moderating factors in the relationship between achievement goal orientation and academic achievement.

Results Overview

This meta-analysis of empirical studies on the relationship between achievement goal orientation and academic achievement included 67 studies comprising 206 effect sizes. Results revealed robust weak correlations between achievement goal orientation and academic achievement (rMAP = 0.19, rMVP = -0.08, rPAP = 0.10, rPVP = -0.12). The correlations for mastery-approach and performance-approach goals with academic achievement were slightly higher than those reported in meta-analyses by Hulleman et al. (2010) (rMAP = 0.11, rPAP = 0.06) and Wirthwein et al. (2013) (rMAP = 0.13, rPAP = 0.08). The correlations for mastery-avoidance and performance-avoidance goals were largely consistent with Van Yperen et al. (2014) (rMVP = -0.07, rPVP = -0.13) and Wirthwein et al. (2013) (rMVP = -0.08, rPVP = -0.12), possibly because previous meta-analyses extracted fewer effect sizes for mastery-approach and performance-approach goals. Notably, this study and other meta-analyses have confirmed weak correlations between achievement goal orientation and academic achievement (Hulleman et al., 2010; Van Yperen et al., 2014; Wirthwein et al., 2013), indicating that while a relationship exists, it is not a direct predictive one but rather requires mediation through process variables such as self-efficacy and learning engagement.

Discussion

Main Effects Interpretation

The meta-analysis found that mastery-approach and performance-approach goals showed significant positive correlations with academic achievement, with rMAP > rPAP, whereas mastery-avoidance and performance-avoidance goals showed significant negative correlations, with |rPVP| > |rMVP|. These

findings indicate that approach goals (mastery and performance) have positive effects on academic achievement, while avoidance goals (mastery and performance) lead to negative outcomes, consistent with most research results (Bong, 2009; Cao, 2012; Uzuntiryaki-Kondakci & Senay, 2015). Individuals with approach goals tend to engage tasks with positive attitudes, correctly recognizing learning benefits and enjoyment, actively confronting difficulties and striving to overcome them, and taking responsibility for their learning, thereby demonstrating superior academic performance (Zhou et al., 2019). Conversely, individuals with avoidance goals tend to examine tasks negatively, easily generating anxiety or unease, unable to confront setbacks and failures directly, typically adopting passive avoidance strategies, and consequently showing lower academic achievement (Yang Xiaochao, 2019).

Furthermore, compared to mastery goals (approach and avoidance), performance goals (approach and avoidance) showed weaker correlations with academic achievement. This occurs because individuals with mastery goals focus on improving their own abilities and value, striving to be no worse than their previous selves (Senko & Dawson, 2017), favoring deep learning processes that emphasize connections between knowledge and understanding (Mouratidis et al., 2018). In contrast, individuals with performance goals focus on improving themselves through social comparison, striving to be no worse than others (Senko, 2019), favoring surface learning processes that emphasize rote memorization and mechanical repetition (Katz-Vago & Benita, 2023). Thus, individuals with mastery goals are better at retaining, integrating, and transferring knowledge during learning, making them more likely to achieve good academic results. Additionally, mastery-oriented individuals engage in active learning based on internal needs and persist when facing failure, whereas performance-oriented individuals engage in passive learning due to external pressure and reduce effort when facing failure (Alhadabi & Karpinski, 2019), inevitably affecting learning effectiveness and resulting in lower academic achievement.

Moderating Effects

Age Stage: The meta-analysis revealed that age stage significantly moderates the relationship between achievement goal orientation and academic achievement, with effect sizes significantly larger in middle and primary school stages than in university stages, supporting Jiang Jingchuan and Liu Huashan' s (2005) findings. Stage-environment fit theory posits that continuous interaction between social environments affects individual psychological development, and individuals actively adapt to and adjust their environments. When environments match individuals' psychological developmental stages, autonomous motivation develops (Eccles & Midgley, 1989). From a developmental perspective, university students experience dramatic physical and psychological changes, with contradictions between adult aspirations and semi-mature status causing psychological and behavioral shifts. Their independence and autonomy demands develop rapidly, and self-awareness becomes more conscious, often moving be-

yond superficial phenomena to actively regulate, control, and argue about causes and patterns (Muller et al., 2021). Simultaneously, university students are in a preparatory period for socialization, requiring formation of socially adaptive personalities and mastery of socially approved behaviors, further developing their demands for independence and self-awareness (Henri et al., 2017). However, most universities cannot completely design curricula according to university students' psychological developmental characteristics, making it difficult to satisfy their autonomy demands (Wang Yijun, 2015). Moreover, from an instructional environment perspective, university teaching predominantly employs traditional transmission-based structures where students remain in passive, controlled learning states (Udosen, 2014). Due to teachers' pressures from research and other rigid indicators, they struggle to guide students' autonomous learning and cultivate autonomy, reducing students' autonomy and decision-making power in classrooms (Hou Jinqin, 2019). This mismatch between developmental stage and environment leads to declines in achievement goal orientation motivation, thereby weakening its relationship with academic achievement.

Gender Ratio: Meta-regression results showed that gender ratio does not significantly moderate the relationship between achievement goal orientation and academic achievement, suggesting cross-gender stability in this relationship, consistent with existing meta-analyses (Huang, 2012). Two possible explanations exist: First, there may be no true differences across gender ratios because role trait differences are insufficient to produce differentiation in learning goal tendencies and motivation between sexes. Although females mature psychologically earlier than males and recognize earlier that improving ability and task mastery are keys to success (Preckel et al., 2008), males often have stronger achievement needs than females, believe more in their abilities, feel confident in using their capabilities to complete tasks, and can direct achievement motivation toward learning tasks and goals (Cheng & Nguyen, 2023). Second, there may be differences across gender ratios, but because most included studies used gender-balanced samples, gender differences did not reach statistical significance.

Measurement Tools: The meta-analysis found that measurement tools significantly moderate the relationship between achievement goal orientation and academic achievement, with AGQ-R showing larger effect sizes than PALS. Three reasons may explain this: First, measurement tools differ in dimensional structure. AGQ-R covers all four dimensions of achievement goal orientation, whereas PALS covers only three dimensions, making AGQ-R more specific in assessing achievement goal orientation and yielding higher correlations. Second, measurement tools differ in assessment scope. AGQ-R assesses domain-specific achievement goals, while PALS emphasizes global-level achievement goals. Theoretically, global-level achievement goal orientation should correlate lower with academic achievement than domain-specific measures (Marsh & Craven, 2006). Third, measurement tools differ in item content. AGQ-R focuses primarily on goal-related items, while PALS contains nearly equal numbers of goal-related and non-goal-related items, with the latter potentially being coded as no-goal, which may underestimate the relationship between achievement goal orientation

and academic achievement (Hulleman et al., 2010).

Achievement Type: The meta-analysis did not find a moderating effect of achievement type, though effect sizes showed stronger correlations between achievement goal orientation and course examinations than standardized tests, consistent with existing research (Wolters, 2004). Two reasons explain this: First, compared to standardized tests that assess higher-order skills detached from specific knowledge, course examinations are more closely related to subject knowledge (Tan et al., 2019), typically using direct feedback from classroom activities, learning evaluations, and performance tasks to reflect students' knowledge mastery and application abilities. Achievement goals are primarily determined based on school-specific subjects or courses (Niepel et al., 2014), aligning better with course examination assessment philosophies. Second, previous meta-analyses indicate that course examinations are more susceptible to motivational variables than standardized tests (Möller et al., 2009), because teachers' judgments of course examinations involve students' positive behavioral characteristics (e.g., diligence, persistence, effort), whereas standardized tests focus on comprehensive abilities and are less influenced by teacher evaluations.

Mediating Mechanisms

Meta-analysis results demonstrate that self-efficacy and learning engagement play both independent and chain mediating roles in the mechanism through which achievement goal orientation affects academic achievement, further validating the effectiveness of achievement goal theory, expectancy-value theory, and self-efficacy theory in educational contexts. Mastery-approach and performance-approach goals significantly positively predicted self-efficacy and learning engagement, whereas mastery-avoidance and performance-avoidance goals showed significant negative correlations with both. Individuals with approach goals tend to exert maximum effort to overcome difficulties, easily obtaining strong achievement and competence feelings, which greatly enhances their self-efficacy and confidence (Sha, 2010), while simultaneously stimulating learning enthusiasm and interest, leading them to invest more energy and time in learning activities (Karakus, 2016). Conversely, individuals with avoidance goals tend to fear failure, cannot face and actively address learning difficulties and challenges, easily develop inferiority complexes and perceive learning as burdensome, resulting in low self-efficacy (Bjornebekk et al., 2013) and unwillingness to invest time and effort in learning (Liu Zaihua, 2022).

Notably, self-efficacy showed a significantly stronger mediating effect than learning engagement in the mechanism linking achievement goal orientation to academic achievement. Two reasons may explain this: First, self-efficacy occupies a proximal position, with achievement goal orientation primarily influencing academic achievement through its effect on self-efficacy. Second, learning engagement comprises emotional, cognitive, and behavioral dimensions. Previous research has confirmed that performance-avoidance goals significantly predict cognitive engagement but not other engagement types (Huang Qingshuang et

al., 2019), suggesting that achievement goal orientation' s effect on learning engagement may be influenced by engagement type. Additionally, research indicates mutual mediating and moderating relationships among emotional, cognitive, and behavioral engagement dimensions (Yin Rui & Xu Huanyun, 2017), which may weaken learning engagement' s mediating effect.

Limitations and Future Directions

Limitations: (1) Regarding literature inclusion, this study involved four predictor variables and required inclusion of at least one mediating variable. Although the collected literature was comprehensive, multiple constraints made it difficult to include equal numbers of studies for all four dimensions. When analyzing moderating variables and testing mediating effects, some subgroups or path effect sizes were sparse, reducing the precision and stability of meta-analytic results. Future research could collect literature published in other languages or include unpublished reports. Additionally, some included studies covered two participant groups, reporting multiple effect sizes that may exhibit interdependence due to similar research designs (Moeyaert et al., 2016). Traditional meta-analytic methods ignore this correlation, potentially overestimating overall effect sizes (Meng Xianxin et al., 2023). Three-level meta-analysis can handle dependency among effect sizes from the same study, maximizing information retention and improving statistical power (Assink & Wibbelink, 2016). Future studies with mostly multiple-effect-size reports should employ three-level meta-analysis. (2) Regarding moderating factors, this study selected only four types based on current evidence, unable to exhaust all potential moderators such as nationality, publication characteristics, and research design, which warrant future investigation. (3) Regarding mediating factors, this study only considered the unidirectional relationship between self-efficacy and achievement goal orientation, though existing research suggests mutual influence. To more comprehensively investigate self-efficacy' s mediating effect, future research should employ cross-lagged models for longitudinal investigation of the three variables.

Future Research Directions: (1) Current research on mastery-avoidance goals and academic achievement mechanisms is limited and insufficient, with academic achievement mostly measured through cross-sectional studies based on large-scale examination scores. Future research should employ experimental, intervention, or longitudinal studies that better explain causal relationships. (2) With the rise of developmental contextualism, increasing researchers recognize that the relationship between achievement goal orientation and academic achievement is not unidirectional or static. Individuals' achievement goal orientation not only affects academic achievement but is also influenced by it (Yang Shuwen et al., 2018), with some empirical support for this hypothesis. For instance, Neubauer et al. (2022) used dynamic assessment methods to conduct a four-week longitudinal daily tracking study of 108 German fifth-grade students, examining daily fluctuations in achievement goal orientation and academic achievement and using structural equation modeling to reveal reciprocal

influences. Additionally, Vu et al. (2022) systematically explored this reciprocal relationship from theoretical and methodological perspectives, providing references for future research. Notably, current literature examining reciprocal influences remains limited and some conclusions have limitations, warranting deeper investigation.

Conclusions

This study draws the following conclusions: (1) Mastery-approach and performance-approach goals are significantly positively correlated with academic achievement, while mastery-avoidance and performance-avoidance goals are significantly negatively correlated with academic achievement, with each indicator showing robust weak correlations. (2) The relationship between achievement goal orientation and academic achievement is moderated by age stage and measurement tools, but not by gender ratio or achievement type. (3) Self-efficacy and learning engagement play mediating roles in the effect of achievement goal orientation on academic achievement, but learning engagement' s mediating effect is significant only in the middle school group, not in the university group.

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Methodological Appendix

Meta-Analysis Procedures in R

The following R code was used for the meta-analysis:

```r
## Install metafor package
library(metafor)

## Import sample variance data and estimate summary effects
res <- rma(yi, vi, data = dat)
inf <- influence(res)

## Plot diagnostics
plot(inf, plotdfb = TRUE)
```

Publication Bias Analysis

Funnel Plot Analysis (using Comprehensive Meta-Analysis 3.0): 1. Run software (Comprehensive Meta Analysis 3.0) 2. Operation guide: `Identify $\rightarrow$ Effect size data $\rightarrow$ Correlation and sample size $\rightarrow$ Run analyses $\rightarrow$ Effect measure: Fisher's Z $\rightarrow$ Publication bias (funnel plot) $\rightarrow$ Next table (fail-safe N, Egger's test intercept)`

P-Curve Analysis: 1. Application: Version 4.06 (https://www.p-curve.com/app4/) 2. Operation guide: https://www.p-curve.com/guide.pdf 3. Reference: Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2014). P-curve: A key to the file-drawer. Journal of Experimental Psychology: General, 143(2), 534-547.

Sensitivity Analysis

One-Study-Removed Analysis (using Comprehensive Meta-Analysis 3.0): Operation guide: `Identify $\rightarrow$ Effect data $\rightarrow$ Correlation and sample size $\rightarrow$ Run analyses $\rightarrow$ Random $\rightarrow$ One study removed`

Moderator Analysis

Categorical Moderators (using Comprehensive Meta-Analysis 3.0): Operation guide: `Identify $\rightarrow$ Effect size data $\rightarrow$ Correlation and sample size $\rightarrow$ Insert $\rightarrow$ Moderator variable $\rightarrow$ Data type $\rightarrow$ Categorical $\rightarrow$ Run analyses $\rightarrow$ Effect measure: Fisher's Z $\rightarrow$ Computational options $\rightarrow$ Group by $\rightarrow$ Select by $\rightarrow$ Next table`

Continuous Moderators (using Comprehensive Meta-Analysis 3.0): Operation guide: `Identify $\rightarrow$ Effect size data $\rightarrow$ Correlation and sample size $\rightarrow$ Insert $\rightarrow$ Moderator variable $\rightarrow$ Data type $\rightarrow$ Decimal $\rightarrow$ Run analyses $\rightarrow$ Effect measure: Fisher's Z $\rightarrow$ Meta regression $\rightarrow$ Add to main screen $\rightarrow$ Run meta regression`

Meta-Analytic Structural Equation Modeling

Procedure (example for MAP; MVP/PAP/PVP require corresponding substitutions):

```
## Install metaSEM package
if(!require(metaSEM)){install.packages('metaSEM')}
library(metaSEM)

## Import data
library(readxl)
data <- read_{excel}("Desktop/工作簿 1.xlsx")
View(data)

## Define variables
nvar <- 4
varnames <- c("MAP","SE","LE","AP")
```

```
labels <- list(varnames,varnames)

## Create correlation matrix list
cormatrices <- readstack(data[,3:8], no.var = nvar, var.names = varnames, diag = FALSE)

## Create sample size vector
n <- data$N ##  查看每种相关关系的研究数量和样本总量 pattern.na(cormatrices, show.na=FALSE) pattern.
head(my.df$data) ##  创建调节效应矩阵 Ax <- matrix(c(0,0,0,0, "0*data.sec_{{{vs}}_{{uni}}}",0,0

## Fit model with moderation
mx.fit1 <- osmasem(model.name="sec_{{{vs}}_{{uni}}} as moderator", Mmatrix=M1, Tmatrix=T0, c
anova(mx.fit1,mx.fit0)

## View results
summary(mx.fit1)
VarCorr(mx.fit1)
```

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Tutorial Resources: - https://lavaan.ugent.be/tutorial/ - https://cran.r-project.org/web/packages/symSEM/symSEM.pdf

Note: Figure translations are in progress. See original paper for figures.