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대학생의 진로결정자기효능감이 취업스트레스에 미치는 영향: 긍정심리자본의 매개효과

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The Effect of Career Decision-Making Self-Efficacy on Job-Seeking Stress among University Students: The Mediating Role of Positive Psychological Capital

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초 록: 본 연구는 대학생의 진로결정자기효능감이 취업스트레스에 미치는 영향에서 긍정심리자본의 매개효과를 규명함으로써, 불확실한 고용 환경에 대응하기 위한 내적 자원의 구조적 역할을 확인하는 데 목적이 있다. 이를 위해 2025년 12월부터 2026년 1월까지 국내 대학생 264명을 대상으로 온라인 설문조사를 실시하였으며, 수집된 자료는 SPSS 22.0과 Process Macro 4.2를 활용하여 분석하였다. 연구 결과는 첫째, 대학생의 진로결정자기효능감은 긍정심리자본과 정적 상관을, 취업스트레스와는 부적 상관을 보였고, 긍정심리자본 역시 취업스트레스와 부적 상관을 나타냈다. 둘째, 진로결정자기효능감과 취업스트레스의 관계에서 긍정심리자본의 유의미한 매개효과가 검증되었다. 본 연구는 취업스트레스를 경험하는 대학생들을 위해 긍정심리자본을 핵심 보호요인으로 규명하였으며, 이를 강화하는 심층적 상담 및 교육적 개입이 이루어질 필요가 있음을 시사한다.

핵심어: 진로결정자기효능감, 취업스트레스, 긍정심리자본, 대학생, 매개효과

Abstract: The purpose of this study is to examine the mediating role of positive psychological capital in the relationship between career decision-making self-efficacy and job-seeking stress among university students, with the aim of clarifying the structural function of internal psychological resources in responding to an uncertain employment environment. An online survey was administered to 264 university students in South Korea from December 2025 to January 2026, and the collected data were analyzed using SPSS 22.0 and Process Macro 4.2. The findings were as follows: First, university students' career decision-making self-efficacy showed a significant positive correlation with positive psychological capital and a significant negative correlation with job-seeking stress; positive psychological capital also exhibited a significant negative correlation with job-seeking stress. Second, positive psychological capital was found to significantly mediate the relationship between career decision-making self-efficacy and job-seeking stress. These findings identify positive psychological capital as a core protective factor for university students experiencing job-seeking stress, and suggest that in-depth counseling and educational interventions aimed at strengthening positive psychological capital are needed.

Keywords: Career Decision-Making Self-Efficacy, Job-Seeking Stress, Positive Psychological Capital, University Students, Mediating Effect

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1. 서론

청년기에 해당하는 대학생 시기는 부모에게서 독립하여 사회적 역할을 정립하고, 생애 전반의 생활양식과 방향을 결정짓는 진로 선택과 취업이 그 어느 때보다 절대적으로 중요한 발달 과업의 시기이다[1~2]. 이러한 발달적 중요성에도 불구하고, 현대 사회의 경기침체와 고용 시장 위축은 대학 졸업을 앞둔 청년들에게 심리적 부담을 가중시키고 있다. 한국경제인협회[3]의 조사에 따르면, 대학 졸업자 및 졸업예정자 10명 중 6명(60.5%)이 실질적인 구직 활동을 하지 않는 '소극적 구직' 상태에 놓여 있는 것으로 나타났다[4]. 이들이 적극적으로 구직에 나서지 못하는 주요 원인으로는 '자신의 역량, 기술, 지식 등이 부족해 보여서(46.7%)'가 가장 높게 나타났으며, '구직 활동을 해도 일자리를 구하지 못할 것 같아서(14.0%)'가 그 뒤를 이었다. 여기서 주목할 점은 '자신의 역량과 기술 부족(46.7%)'이라는 전반적인 자기 능력에 대한 자기효능감 부족과 '구직 활동을 해도 일자리를 구하지 못할 것 같다(14.0%)'라는 진로 성과에 대한 확신 부재가 전체 원인의 절반 이상인 60.7%를 차지한다는 것이다. 이는 과반수의 대학생이 외부의 구조적 취업난 이전에 자신의 능력에 대한 자신감 부족과 진로에 대한 내적 확신의 부재, 그리고 지속적인 진로 고민으로 인해 구직 활동에 적극적으로 나서지 못하고 있음을 시사한다.

이러한 내적 자원의 결핍은 대학생들에게 단순한 취업 지연을 넘어 심각한 심리적 위축과 스트레스를 야기한다. 미취업 20대 청년들은 취업한 청년에 비해 신체화 증상, 강박증, 대인예민성, 우울, 적대감 및 불안 등 취약한 정신건강 상태를 보이는 것으로 나타났으며[6], 더 나아가 취업스트레스는 자살사고와 같은 극단적인 심리적 위기로까지 연결될 수 있음이 다수의 연구를 통해 보고되었다[5]. 통계청[7]이 발표한 2023년 사망원인통계에 따르면, 20대 사망자의 52.7%가 자살로 삶을 마감한 것으로 나타나, 취업스트레스가 집중되는 대학생 연령대에서 자살이 단순한 심리적 불편을 넘어 실제 생명을 위협하는 심각한 문제임을 단적으로 보여준다. 특히 졸업 학년의 경우 취업스트레스는 진로결정 수준과도 직접 연결되어 향후 사회 진출의 성패를 좌우하므로[8], 이들의 스트레스를 완화할 핵심 보호 요인을 규명하는 것은 개인의 정신건강 차원을 넘어 사회적 차원에서도 중요한 과제이다.

기존의 취업스트레스 관련 선행연구들은 이를 완화하기 위한 방안으로 부모의 지지, 교수지지, 가족응집력과 같은 외부의 사회적 지지체계를 탐색하는 데 집중하는 경향이 있었다[9~11]. 그러나 사회적 지지는 외부 환경과 관계의 질에 크게 의존한다는 점에서 개인이 자율적으로 통제하기 어려운 한계가 있다. 장기화되는 취업난 속에서는 외부의 도움 없이도 스스로를 지탱할 수 있는 내적 자원의 확립이 절실하며[12], 이러한 내적 자원의 핵심으로 불확실한 취업 환경 속에서도 주도적으로 진로 과제를 수행할 수 있게 하는 '진로결정자기효능감(Career Decision-Making Self-Efficacy)'이 강조된다[13]. 실제로 다수의 선행연구에서 진로결정자기효능감이 높은 학생일수록 구직난이나 진로장벽 앞에서도 취업스트레스 수준이 유의미하게 낮아짐이 입증되었다[14~15]. 그러나 아무리 취업준비를 철저히 할 수 있다는 확신이 있더라도 반복적인 거절과 실패에 노출되다 보면 그 믿음마저 쉽게 훼손될 수 있으므로[16], 진로결정자기효능감을 지탱하고 취업스트레스로 인한 심리적 고통을 흡수해 줄 수 있는 포괄적인 심리 자원으로서 '긍정심리자본(Positive Psychological Capital)'의 역할에 주목할 필요가 있다[17].

그러나 기존 연구들은 주로 진로결정자기효능감이 취업스트레스에 미치는 직접적인 영향이나 외부 지지 변인의 조절 효과에 집중해 왔다[9,11,18]. 인지적 신념인 진로결정자기효능감이 긍정심리자본을 매개로 하여 어떠한 심리적 과정을 거쳐 취업스트레스에 영향을 미치는지에 대한 통합적 경로 연구는 여전히 부족한 실정이다[19]. 따라서 진로결정자기효능감과 취업스트레스 사이에서 긍정심리자본의 매개적 기능과 역할을 실증적으로 규명하는 것은, 대학생의 내적 심리 자원을 강화하는 상담 및 교육 개입의 근거를 마련한다는 점에서 학문적, 실천적 필요성이 크다.

본 연구는 대학생의 진로결정자기효능감이 취업스트레스에 영향을 미치는 과정에서 긍정심리자본의

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매개효과를 검증함으로써, 인지적 자원인 진로결정자기효능감이 정서적 심리 자원을 경유하여 취업스트레스를 완화하는 구조적 경로를 실증적으로 규명하고자 한다. 이러한 연구 결과는 대학의 진로 및 취업 상담 현장에서 단순한 취업 기술 지도를 넘어, 대학생 스스로 진로를 개척할 수 있는 인지적 자신감과 내면의 긍정적 심리 자원을 통합적으로 다루는 교육 및 상담의 기초자료로 활용될 수 있을 것이다. 특히 긍정심리자본의 영향력에 대한 실증적 근거는 취업스트레스 관리 및 극복과 심리적 자원 강화를 목적으로 하는 진로 집단상담 프로그램 개발에 있어, 프로그램에 우선 적용할 핵심 하위요인을 선정하고 이를 체계적으로 구성하기 위한 구체적인 설계 지침을 제공함으로써 프로그램의 실효성을 높이는 데 기여할 것으로 기대된다.

따라서 본 연구의 목적을 달성하기 위한 연구문제를 제시하면 다음과 같다.

연구문제 1. 대학생의 진로결정자기효능감, 긍정심리자본, 취업스트레스 간의 관계는 어떠한가?

연구문제 2. 대학생의 진로결정자기효능감과 취업스트레스의 관계에서 긍정심리자본은 매개효과를 가지는가?

2. 이론적 배경

2.1 취업스트레스

스트레스(stress)의 어원은 라틴어인 stringer 즉, ‘팽팽하게 조이다’에서 유래하였으며, 개인이 보유한 자원의 한계를 넘어 개인의 안녕을 위협하는 개인과 환경 간의 특정한 상호작용으로 정의된다[20]. 특히 대학생이 경험하는 취업스트레스는 졸업 후 취업과 관련된 문제로 신체적·심리적 평형상태가 파괴되고 긴장감이나 불안을 느끼는 상태를 의미하며[21], 취업의 실패가 반복됨에 따라 나타나는 미취업 스트레스 증후군으로도 일컬어진다[13,22]. 취업스트레스는 노동시장의 제약, 전공의 불일치, 취업준비에 대한 부담감 등 다양한 내외적 요구로 인해 유발되며[23], Lazarus와 Folkman[20]의 인지적 평가 이론에 따르면 외부의 위협적인 환경 그 자체보다는 개인이 이를 대처할 내적 자원이 부족하다고 평가할 때 더욱 심화된다.

취업스트레스의 결과는 단순한 심리적 불편감을 넘어 매우 광범위하고 심각하다. 취업스트레스가 높을수록 우울, 불안, 강박증, 대인예민성과 높은 상관을 보이며[6,16], 더 나아가 자살사고와 자살위험성에까지 영향을 미치는 것으로 보고되었다[1]. 특히 이러한 부정적 결과는 진로 선택과 취업 준비가 집중되는 대학생 시기에 더욱 두드러지게 나타나며, 학업 수행, 대학생활 적응, 정신건강 전반에 걸쳐 복합적인 악영향을 미친다[18]. 따라서 대학생이 경험하는 취업스트레스는 개인의 심리적 고통에 그치지 않고 사회적 차원의 문제로 확장될 수 있으므로, 이를 완충할 핵심 보호 요인을 탐색하는 것이 시급히 요구된다[18].

2.2 진로결정자기효능감

진로결정자기효능감(Career Decision-Making Self-Efficacy: CDMSE)은 자기효능감을 진로 영역에 적용하여 확장한 개념으로, 진로결정과 관련된 과제들을 성공적으로 수행할 수 있는 개인의 능력에 대한 믿음으로 정의된다[24]. Bandura[25]의 자기효능감 이론을 기반으로, 진로결정자기효능감이 높은 학생은 진로 관련 과제 수행에서 성공적인 결과를 이끌어낼 가능성이 높으며, 불확실한 상황에서도 적극적으로 문제를 해결하는 경향이 있다[18~19].

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Lazarus와 Folkman[20]의 인지적 평가 이론에 따르면, 개인이 스트레스 상황을 어떻게 평가하고 해석하느냐에 따라 스트레스의 경험 수준이 결정된다. 진로결정자기효능감이 높은 개인은 취업 과정에서의 불확실성과 장벽을 위협이 아닌 극복 가능한 도전으로 평가하는 경향이 있어, 결과적으로 취업스트레스를 낮게 경험하게 된다[11]. 다수의 선행연구에서 진로결정자기효능감이 높을수록 취업스트레스가 유의미하게 낮아지는 부적 관계가 일관되게 확인되었다[13,15,18].

2.3 긍정심리자본

긍정심리자본을 제안한 Luthans[26]는 긍정심리자본을 개인이 역경 속에서도 스스로 발전하고자 하는 긍정적인 심리상태로 정의하였다. 구체적으로 긍정심리자본은 과업의 성공을 위해 필요한 자신감을 가지는 자기효능감, 목표를 향해 인내하고 경로를 재설정하는 희망, 현재와 미래의 성공에 긍정적인 기대를 갖는 낙관성, 역경에 직면했을 때 이를 극복하고 평형상태로 되돌아오는 회복탄력성이라는 네 가지 하위요인으로 구성된 통합적인 심리 역량이다[17,27].

긍정심리자본의 가장 중요한 특성은 지능이나 기질처럼 타고난 고정적 성향이 아니라, 간단한 교육과 훈련, 미시적 개입을 통해 지속적으로 개발하고 개선할 수 있는 상태적 특성을 지닌다는 것이다[28~29]. 이는 부모의 성취압력, 가족응집력, 사회적 지지처럼 개인이 직접 통제하기 어려운 외부 환경 변인과 긍정심리자본을 근본적으로 구별하는 핵심이다[9,11]. 외부의 지지 자원은 관계의 질이나 환경 여건에 따라 유동적일 수밖에 없지만, 긍정심리자본은 개인의 노력과 훈련을 통해 자율적으로 강화하고 축적할 수 있다[27]. 이러한 개발 가능성은 곧 상담 및 교육 개입의 실용적 근거가 되며, 불안정한 취업 시장에서 자력으로 심리적 회복력을 구축해 나갈 수 있다는 점에서 긍정심리자본의 실천적 가치는 더욱 높다[28].

2.4 진로결정자기효능감, 긍정심리자본, 취업스트레스의 관계

진로결정자기효능감은 취업스트레스에 직접적인 영향을 미칠 뿐 아니라, 긍정심리자본을 형성하는 선행요인으로도 작용한다[19]. 진로 과업을 성공적으로 수행할 수 있다는 인지적 확신은 자신감에 머무는 것이 아니라, 역경 상황에서도 목표를 포기하지 않는 희망과 낙관성을 이끌어내며, 이는 긍정심리자본의 형성과 강화로 이어지는 심리적 토대가 된다[30]. 다시 말해, 진로결정자기효능감이 높은 대학생일수록 불확실한 구직 환경 속에서도 스스로 희망과 낙관성, 회복탄력성을 지속적으로 훈련하고 발현하며 다차원적인 긍정심리자본을 구축해 나가는 것이다[10,31].

이렇게 형성된 긍정심리자본은 실제 구직 과정에서 강력한 적응기제로 작용한다. 박윤희[12]에 따르면, 긍정심리자본이 강화되면 미래 취업에 대한 불안감과 심리적 긴장감이 완화되어 결과적으로 취업스트레스를 유의미하게 감소시키는 것으로 확인되었다. 또한, 긍정심리자본의 네 가지 하위요인이 통합적으로 작용할 때 상승효과가 나타나는 것으로 알려져 있어, 긍정심리자본은 각 하위요인의 개별적 효과를 초월하는 다차원적 심리 자원으로서의 의의를 지닌다[17, 28].

그럼에도 불구하고 기존 연구들은 주로 진로결정자기효능감이 취업스트레스에 미치는 직접적인 영향이나 외부 지지 변인의 조절 효과에 집중해 왔다[9,11,18]. 인지적 신념인 진로결정자기효능감이 긍정심리자본을 매개로 하여 어떠한 심리적 과정을 거쳐 취업스트레스에 영향을 미치는지에 대한 통합적 경로 연구는 여전히 부족한 실정이다[19]. 이에 진로결정자기효능감이 긍정심리자본을 매개로 취업스트레스에 영향을 미치는 구조적 경로를 이론적으로 예측할 수 있으며, 이러한 변인 간의 관계를 실증적으로 검증할 필요성이 제기된다.

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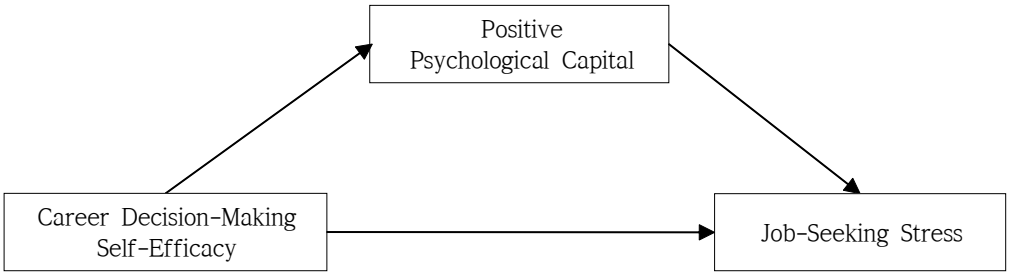
3. 연구방법

3.1 연구모형

대학생의 진로결정자기효능감이 취업스트레스에 미치는 영향에서 긍정심리자본의 매개효과를 검증하기 위한 연구모형은 [Figure 1]과 같다.



[Figure 1] Research Model

3.2 연구대상 및 자료수집 절차

본 연구는 2025년 12월부터 2026년 1월까지 국내 소재 대학교에 재학 또는 휴학 중인 대학생을 대상으로 편의 표집과 더불어 눈덩이 표집 방법을 통해 표본을 추출하였다. 설문 대상자 모집은 대학생 온라인 커뮤니티 플랫폼에 연구목적 및 내용을 설명하고 동의를 얻은 후 설문을 실시하였다. 이렇게 수집된 자료 중 오류가 있거나 무성의하게 응답한 3부를 제외하고 264명의 자료를 분석에 사용하였다. 본 연구의 표본 수(N=264)는 G-Power 3.1.9.7 프로그램을 이용한 다중회귀분석의 최소 표본 수 산출 결과(효과크기 f2=.15, 유의수준 α=.05, 검증력 1-β=.95, 예측 변인 2개 기준)인 107명을 충분히 상회하므로, 통계적 검증력을 확보한 적정 수준의 표본으로 판단된다.

연구대상에서 남학생은 94명(35.6%), 여학생은 170명(64.4%)으로 나타났으며, 학년별로는 1학년이 26명(9.8%), 2학년이 56명(21.2%), 3학년이 51명(19.3%), 4학년(4학년 이상)이 110명(41.7%), 휴학생이 21명(8.0%)으로 나타났다. 연령별로는 18~20세는 52명(19.7%), 21~23세는 119명(45.1%), 24~26세는 73명(27.7%), 27~29세는 13명(4.9%), 30~34세는 7명(2.7%)으로 나타났으며, 전공 계열별로는 인문 계열은 64명(24.2%), 사회 계열은 55명(20.8%), 공학 계열은 60명(22.7%), 자연 계열은 31명(11.7%), 교육 계열은 5명(1.9%), 의학 계열은 29명(11.0%), 예체능 계열은 16명(6.1%), 기타는 4명(1.5%)으로 나타났다. 거주 지역별로는 서울과 경기가 각각 90명(34.1%)으로 나타났으며, 강원권 5명(1.9%), 충청권 21명(8.0%), 경상권 36명(13.6%), 전라권 20명(7.6%), 제주권 2명(0.8%)으로 나타났다.

3.3 측정도구

3.3.1 진로결정자기효능감 척도

본 연구에서는 Taylor와 Betz[32]가 개발하고 이은경[33]이 국내 대학생의 실정에 맞게 번안 및 타당화

한 진로결정자기효능감 단축형(CDMSES-SF)을 사용하였다. 해당 척도는 국내 다수의 선행연구를 통해 구조 타당도가 검증된 도구이다. 이 척도의 하위요인은 직업정보수집 5문항(예: 내가 관심 가지고 있는 직업에 대한 정보를 찾을 수 있다), 자기평가 5문항(예: 나는 마음에 두고 있는 직업들 가운데 한 가지 직업을 선택할 수 있다), 목표선택 5문항(예: 나는 내가 원하는 라이프스타일에 맞는 진로를 결정할 수 있다), 미래계획 5문항(예: 나는 선택한 직업이 만족스럽지 않으면 다른 직업으로 바꿀 수 있다), 문제해결 5문항(예: 나는 처음의 선택이 불가능할 경우를 대비해 합리적인 대안이나 다른 진로를 알아낼 수 있다)으로, 총 25문항으로 구성되어 있다. 진로결정자기효능감 척도는 1점(전혀 그렇지 않다)에서 5점(매우 그렇다)까지의 Likert 척도로 평정되며 점수가 높을수록 진로결정자기효능감 수준이 높음을 의미한다. 본 연구에서의 하위요인별 신뢰도는 직업정보수집 .825, 자기평가 .864, 목표선택 .763, 미래계획 .803, 문제해결 .829로 나타났으며, 진로결정자기효능감의 전체 신뢰도(Cronbach’s α)는 .951로 나타났다.

3.3.2 취업스트레스 척도

본 연구에서는 김향수[34]가 한국 대학생을 대상으로 개발하고 타당화한 취업스트레스 척도를 사용하였다. 해당 도구는 개발 과정에서 탐색적 및 확인적 요인분석을 통해 타당도가 검증된 척도이다. 이 척도의 하위요인은 취업스트레스-반응(신체 및 행동의 변화, 정서적 어려움) 12문항(예: 취업문제로 인해 평소보다 수면양이 줄었거나 늘었다, 취업 문제를 생각하면 무력감이 느껴진다)과 취업스트레스-자극(불안감, 취업준비, 진로고민) 8문항(예: 취업 준비를 위한 시간이 부족해서 초조하다, 취업 준비로 인해 경제적 부담감을 느낀다, 나의 전공과 취업하고 싶은 분야가 달라서 고민이다)으로, 총 20문항으로 구성되어 있다. 취업스트레스 척도는 5번과 12번 문항이 역문항으로 구성되어 있으며, 1점(전혀 그렇지 않다)에서 5점(매우 그렇다)까지의 Likert 척도로 평정된다. 점수가 높을수록 취업스트레스 수준이 높은 것을 의미한다. 취업스트레스의 전체 신뢰도(Cronbach’s α)는 .939로 나타났다.

3.3.3 긍정심리자본 척도

본 연구에서는 Luthans 등[17]이 개발한 긍정심리자본 척도(PCQ)를 바탕으로, 탁하연[35]이 국내 대학생의 특성에 맞게 개발 및 타당화한 대학생용 긍정심리자본 척도를 사용하였다. 해당 척도는 탁하연[35]의 연구에서 델파이 조사와 요인분석을 통해 내용 및 구조 타당도가 확보된 도구이다. 이 척도의 하위요인은 자기효능감 16문항(예: 인생에서 부딪히는 대부분의 문제를 다룰 능력이 있다), 희망 20문항(예: 목표 달성을 위해 한 가지 방법이 실패하더라도 다른 해결방법으로 해결할 수 있다), 낙관성 16문항(예: 나에게 중요한 것을 이루기 위해 꾸준히 나아간다), 회복탄력성 19문항(예: 힘든 일을 겪어도 빠르게 회복하는 편이다)으로, 총 71문항으로 구성되어 있다. 긍정심리자본 척도는 1점(전혀 그렇지 않다)에서 5점(매우 그렇다)까지의 Likert 척도로 평정되며 점수가 높을수록 긍정심리자본 수준이 높음을 의미한다. 본 연구에서의 하위요인별 신뢰도는 자기효능감 .953, 희망 .960, 낙관성 .942, 회복탄력성 .927로 나타났으며, 긍정심리자본의 전체 신뢰도(Cronbach’s α)는 .982로 나타났다.

3.4 자료분석방법

본 연구는 SPSS 22.0과 Process Macro 4.2를 이용하여 수집된 자료를 분석하였고, 그 결과는 다음과 같다. 우선, 연구대상의 인구통계학적 특성을 파악하기 위해 빈도 분석을 실시하였다. 둘째, 각 변인들의 신뢰도를 확인하기 위해 Cronbach’ α 계수를 활용하였다. 셋째, 주요 변인의 기술통계분석을 실시하

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였고, 그 과정에서 왜도값과 첨도값을 확인하여 변인들의 정규분포 가정 충족 여부를 판단하였다. 넷째, Pearson 상관분석을 실시하여 변인들 간 관계를 확인하였으며, 다섯째, 대학생의 진로결정자기효능감과 취업스트레스의 관계에서 긍정심리자본의 매개효과는 SPSS Process Macro model number 4를 활용하여 검증하였다. 마지막으로 부트스트래핑 테스트(Bootstrapping-test)를 통한 매개효과의 유의성을 확보하였다.

4. 연구결과

4.1 주요변인의 기술 통계학적 특성 및 상관관계

기술통계분석을 통해 주요변인의 평균과 표준편차, 왜도, 첨도를 확인하였다. 그 결과, 모든 측정 변인들의 왜도와 첨도의 절댓값이 2와 7을 넘지 않아 다변량 정규분포 가정을 충족하였다. 다음으로 각 변인들 간 상관분석의 결과는 다음과 같다. 우선, 대학생의 진로결정자기효능감은 긍정심리자본과 유의한 정적 상관(r=.809, p<.01)을 보였고, 취업스트레스와는 유의한 부적 상관(r=-.504, p<.01)을 나타내었다. 이는 진로결정자기효능감이 높은 대학생일수록 긍정심리자본 수준은 높고, 취업스트레스는 낮아진다는 것을 의미한다. 다음으로 대학생의 긍정심리자본과 취업스트레스는 높은 부적 상관(r=-.493, p<.01)을 보였다. 이러한 결과는 대학생의 긍정심리자본 수준이 높을수록 취업스트레스는 낮아진다는 것을 나타낸다. 이와 같은 결과는 <Table 1>에 제시하였다.

<Table 1> Correlations, Skewness, and Kurtosis of Major Variables(*N=264*)

	1	2	3
1. Career Decision-Making Self-Efficacy	1		
2. Positive Psychological Capital	.809**	1	
3. Job-Seeking Stress	-.504**	-.493**	1
Mean(M)	3.495	3.401	3.051
Standard Deviation(SD)	.679	.626	.849
Skewness	-.295	-.467	-.324
Kurtosis	.079	.495	-.630

** $p<.01$

4.2 대학생의 진로결정자기효능감과 취업스트레스의 관계에서 긍정심리자본의 매개효과

대학생의 진로결정자기효능감과 취업스트레스의 관계에서 긍정심리자본의 매개효과를 검증하기 위해 SPSS Process Macro model number 4를 이용하였고, 부트스트래핑을 5,000회로 지정하였으며, 신뢰구간은 95%로 설정하여 분석하였다. 그 결과는 <Table 2>, [Figure 2]에 제시하였다.

매개변인 모형에서는 독립변인이 매개변인에 미치는 영향을 확인하는 과정이 통계적으로 유의하여 모형이 적합하였고(F=497.587, p<.001), 독립변인의 설명력은 65.5%로 나타났다. 그 결과 대학생의 진로결정자기효능감은 긍정심리자본에 정적으로 유의한 영향을 미쳤다(B=.746, p<.001). 다음으로 종속변인 모형에서는 독립변인과 매개변인이 함께 투입되었을 때, 종속변인에 미치는 영향력을 검증하는 단계로, 이 모형 또한 통계적으로 유의하였고(F=49.488, p<.001), 독립변인의 설명력은 27.5%였다. 대학생의 진로결정자기효능감은 취업스트레스에 부적으로 유의한 영향(B=-.380, p<.01)을 미쳤다. 그리고 긍정심리자본 역

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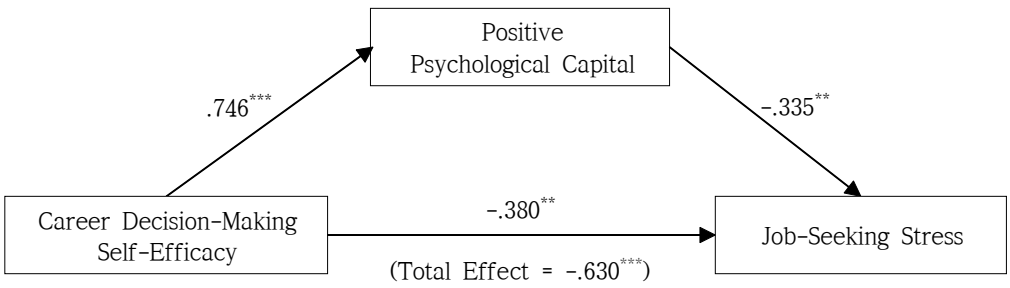
시 취업스트레스에 부적으로 유의한 영향(B=-.335, p<.001)을 주었다. 따라서 대학생의 긍정심리자본은 진로결정자기효능감과 취업스트레스의 관계를 매개하였음을 알 수 있다. 또한, 독립변인의 영향력이 매개변인 모형과 종속변인 모형 모두에서 유의한 결과를 냈으므로 부분매개효과가 있다는 것을 확인하였다. 마지막으로 진로결정자기효능감과 취업스트레스 간 경로의 총효과는 B=-.630(p<.001)였으나 매개변인인 긍정심리자본이 투입되면서 진로결정자기효능감과 취업스트레스 간 경로의 직접효과는 B=-.380(p<.01)으로 감소하여 긍정심리자본의 매개 역할을 확인할 수 있었다. 즉, 진로결정자기효능감이 긍정심리자본에 유의한 영향을 미쳤고, 긍정심리자본 또한 취업스트레스에 유의한 영향을 미쳤으며, 진로결정자기효능감과 취업스트레스 간 경로의 총효과가 직접효과보다 크다는 점은 매개효과가 있음을 의미한다.

<Table 2> The Mediating Effect of Psychological Capital on the Relationship between Career Decision-Making Self-Efficacy and Job-Seeking Stress(*N=264*)

	Mediating Variable Model(Dependent Variable: Positive Psychological Capital)				
	B	*SE*	*t*	LLCI*	ULCI**
Constant	.794	.119	6.674***	.560	1.029
Career Decision-Making Self-Efficacy	.746	.033	22.307***	.680	.812
	R^2		*F*		*p*
	.655		497.587		.000
	Dependent Variable Model(Dependent Variable: Job-Seeking Stress)				
	B	*SE*	*t*	LLCI*	ULCI**
Constant	3.044	.254	12.753***	5.018	6.017
Career Decision-Making Self-Efficacy	-.380	.112	-3.389**	-.601	-.159
Positive Psychological Capital	-.335	.122	-2.751**	-.574	-.095
	R^2		*F*		*p*
	.275		49.488		.000

** *p*<.01, *** *p*<.001
*LLCI=95% 신뢰구간 내에서의 하한값,
**ULCI=95% 신뢰구간 내에서의 상한값



** *p*<.01, *** *p*<.001

[Figure 2] Mediating Effect of Positive Psychological Capital

대학생의 진로결정자기효능감과 취업스트레스의 간접효과는 부트스트래핑 테스트(Bootstrapping-test)를 활용하여 검증한 결과 <Table 3>과 같이 부트스트래핑의 상한값과 하한값 사이에 0이 존재하지 않아

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간접효과는 유의한 것으로 나타났다. 따라서 긍정심리자본은 대학생의 진로결정자기효능감과 취업스트레스의 관계를 매개한다는 본 연구의 가설은 검증되었다.

<Table 3> Bootstrapping Test Results for the Mediating Effect of Positive Psychological Capital(*N=264*)

Effect	*B*	*SE*	LLCI*	ULCI**
Total Effect	-.630	.067	-.761	-.498
Direct Effect	-.380	.112	-.601	-.159
Indirect Effect	-.250	.097	-.445	-.069

*LLCI=boot 간접효과의 95% 신뢰구간 내에서의 하한값
**ULCI=boot 간접효과의 95% 신뢰구간 내에서의 상한값

5. 논의 및 결론

본 연구는 대학생의 진로결정자기효능감, 긍정심리자본, 취업스트레스 간의 상관관계를 살펴보고, 대학생의 진로결정자기효능감이 취업스트레스에 미치는 영향에서 긍정심리자본의 매개효과를 검증하는데 그 목적이 있다. 본 연구에서 얻은 주요 결과에 대해서 논의하면 다음과 같다.

첫째, 대학생의 진로결정자기효능감, 긍정심리자본, 취업스트레스의 각 변인 간 상관을 분석한 결과, 우선 진로결정자기효능감은 긍정심리자본과 정적 상관을 보였다. 이는 선행연구의 김수란[19], 윤정혜[30]와 일치하는 결과이며, 자신의 진로와 관련된 과제를 성공적으로 수행할 수 있다는 진로결정자기효능감이 높은 학생일수록 위기 상황에서도 목표를 향해 나아가는 희망과 긍정적 기대를 포함하는 긍정심리자본 수준이 활발하게 형성된다는 것을 알 수 있다. 다음으로 진로결정자기효능감은 취업스트레스와 유의한 부적 상관관계가 확인되었다. 이러한 결과는 대학생을 대상으로 한 진로결정자기효능감과 취업스트레스의 관계를 검증한 기존의 연구들인 이옥순[13], 김성원과 김정규[16], 정재홍[18], 이용길과 강경희[36]의 결과와 일치한다. 그러므로 진로결정자기효능감 수준이 높은 대학생의 경우, 불확실한 취업 환경 속에서도 자신의 진로 방향을 뚜렷하게 설정하고 직업정보를 주도적으로 탐색하여 취업 과정에서 발생하는 심리적 압박감이나 신체적 긴장감을 덜 경험하며, 나아가 구직 상황의 어려움에 맞서 역동적으로 대처하는 경향이 있다. 마지막으로 대학생의 긍정심리자본과 취업스트레스에서 높은 부적 상관을 보였다. 이는 대학생을 대상으로 최근 연구들의 결과인 박윤희[12], 강지연과 지명원[27]을 지지하는 것이다. 따라서 상태적 특성으로 훈련된 개인의 긍정심리자본이 풍부할수록 자신이 설정한 진로 목표를 달성해 나가는 과정에서 미래 취업에 대한 막연한 불안감을 해소하고 심리적 긴장감을 유연하게 이겨내게 되며, 결과적으로 취업스트레스라는 부정적 감정을 덜 경험하게 됨을 보여준다.

둘째, 대학생의 진로결정자기효능감이 취업스트레스에 영향을 미치는 과정에서 긍정심리자본은 이 두 변인을 매개하는 것으로 나타났다. 이는 목표한 진로 과업을 성공적으로 수행할 수 있다는 내면의 신념인 진로결정자기효능감이 확고할수록, 불확실한 역경 속에서도 긍정적 결과를 기대하며 유연하게 적응해 내는 긍정심리자본이 더욱 견고하게 형성됨을 의미한다[13,35]. 실제로 김수란[19]과 윤정혜[30]의 연구에서는 진로결정에 대한 내적 확신이 강한 대학생일수록 긍정심리자본의 하위요인인 희망, 낙관성, 회복탄력성 등이 역동적으로 발현되며 통계적으로 유의미한 정적 영향을 미친다고 보고하여, 매개 경로를 탄탄하게 뒷받침한다. 나아가 이렇게 견고하게 형성된 긍정심리자본은 구직 환경에서 파생되는 심리적 압박감과 정신적 긴장 상태인 취업스트레스에 유의미한 대처 기제로 작용하는 것으로 확인되었다. 진로 변인과 긍정심리자본의 관계를 연구한 박선하[37]는 긍정심리자본이 풍부한 대학생일수록 스트레스 상황에서 더 나은 적응력을 보이며 부정적 사고방식을 통제한다고 밝혔다. 또한 박윤희[12]의 연구 역시 긍정심리자본이 취업스트레스에 직접적인 부적 영향을 미친다는 점을 실증하였다. 이는 내면의 긍정심리자본이

풍부한 개인일수록 장기화된 취업 준비 과정에서 마주하는 불안과 긴장감에 능동적으로 대처하게 되며, 결과적으로 취업스트레스라는 부정적 감정을 현저히 덜 경험하게 됨을 의미한다. 이처럼 긍정심리자본은 진로결정자기효능감이 취업스트레스에 영향을 주는 과정에서 매개 역할을 하는 중요한 변인임이 증명되었다. 따라서 본 연구의 결과는 대학의 진로 및 취업 상담 현장에서 단순한 취업 기술 위주의 외형적 지도를 넘어 진로결정자기효능감과 긍정심리자본을 통합적으로 다루는 심층적 개입의 필요성을 실증적으로 뒷받침한다. 특히 긍정심리자본은 교육과 훈련을 통해 충분히 개발할 수 있는 상태적 특성을 지니고 있으므로, 취업스트레스 대처를 위한 진로 집단상담 프로그램 개발 시 본 연구에서 확인된 매개 기제로서의 긍정심리자본을 우선적으로 강화해야 할 것이다. 이는 예측 불가능한 고용 시장이라는 위협 앞에서도 대학생들이 내적 효능감을 잃지 않고 스트레스 상황을 유연하게 이겨내며 주도적으로 진로 과제를 수행해 나가도록 돕는 구체적이고 실효성 있는 설계 지침이 될 것이다.

본 연구결과의 시사점은 다음과 같다. 첫째, 취업스트레스와 관련하여 기존 연구들이 주로 부모나 교사의 지지, 가족 응집력과 같은 외부 환경적 요인에 초점을 맞추어 왔다면[11~12], 본 연구는 취업난이라는 통제하기 어려운 환경 속에서도 대학생이 주도적으로 상황을 관리할 수 있는 개인 내적 자원인 긍정심리자본의 역할에 주목하였다는 데 의의가 있다. 특히 긍정심리자본은 고정된 기질이 아닌 상담과 교육을 통해 충분히 개발 가능한 상태적 특성을 지니므로, 취업스트레스에 취약한 대학생들에게 훈련과 개입을 통해 실질적인 변화를 이끌어낼 수 있는 핵심 보호 변인을 규명했다는데 의의가 있다[19,35,37,38]. 둘째, 대학의 진로 상담 및 교육 현장에서 진로결정자기효능감과 긍정심리자본을 통합적으로 다루는 심층적 개입의 근거를 마련하였다. 본 연구에서 확인된 매개 경로는 취업스트레스에 능동적으로 대처하기 위한 진로 집단상담 및 코칭 프로그램 개발 시, 긍정심리자본을 체계적으로 훈련하고 강화할 수 있는 구체적인 설계 지침이자 상담적 핵심 구조로 활용될 수 있을 것이다[12,31]. 셋째, 진로결정자기효능감과 취업스트레스 사이를 잇는 긍정심리자본 매개 경로를 입증함으로써 개입의 효율성을 높였다. 단순히 진로 확신을 높이는 것에서 나아가, 구직 과정의 역경을 도약의 기회로 이겨낼 수 있는 심리적 동력을 함께 배양할 때 스트레스 대처 및 예방 효과가 극대화됨을 시사한다[30]. 이는 예측 불가능한 고용 시장의 위협 앞에서도 대학생들이 심리적으로 무너지지 않고 주도적으로 진로 과제를 수행하도록 돕는 실효성 있는 실천적 기초자료가 될 것이다[35,37].

본 연구의 제한점 및 후속연구를 위한 제언은 다음과 같다. 첫째, 본 연구는 국내 일부 대학생을 대상으로 편의 표집되었으며, 성별이나 전공 등 인구통계학적 비율이 다소 불균형하게 수집된 측면이 있다. 따라서 본 연구의 결과를 전체 대학생으로 일반화하는 데에는 한계가 있으므로, 후속연구에서는 지역이나 대학 계열 등의 비율을 고르게 분포시켜 표집의 대표성을 확보할 필요가 있다. 또한, 본 연구는 특정 시점에 데이터를 수집한 횡단적 연구로 수행되었다. 비록 매개효과 분석을 통해 변인 간의 구조적 관계를 확인하였으나, 변인들 간의 엄격한 인과관계를 규명하고 시간에 따른 변화 추이를 파악하는 데는 한계가 있다. 향후 연구에서는 종단적 설계를 통해 변인 간의 선후 관계와 지속적인 영향을 입증할 필요가 있다. 둘째, 본 연구에서 사용된 모든 데이터는 자기보고식 설문지로 수집되었다. 이는 응답자가 자신을 사회적으로 바람직하다고 판단되는 방향으로 포장하여 반응했을 가능성이 있으며, 동일 응답자가 독립·매개·종속변인을 모두 측정함으로써 발생하는 공통방법편향의 우려가 있다. 본 연구에서는 이를 통제하기 위해 설문지 구성을 무작위화하고 익명성을 강조하는 등 노력을 기울였으나 원천적인 배제가 어려우므로, 추후 연구에서는 심층 면접이나 타인 평정 등 다각적 측정 방식을 병행하여 데이터의 객관성과 신뢰도를 높여야 할 것이다. 셋째, 본 연구에 투입된 변인들은 각각 다수의 하위요인으로 구성되어 있으나, 분석 과정에서는 각 변인의 총점을 활용한 단일요인으로 간주하여 분석을 실시하였다. 이는 대학생의 진로 및 심리적 자원이 취업스트레스에 미치는 핵심 매개 매커니즘을 보다 명확하고 응집력 있게 파악하기 위한 조치였으나, 각 하위요인이 지닌 고유한 특성이 결과에 미치는 세부적인 영향력을 간과했을 가능성이 있다. 따라서 후속 연구에서는 잠재변인들 간 구조를 검증하는 연구방법을 고려할 필요가 있다.

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유튜브 중독 영향요인에 대한 메타분석: 코로나 팬데믹 급성기(Acute phase) 연구*

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A meta analysis of factors Affecting of YouTube Addiction: Analysis of COVID-19 Pandemic Acute Phase Period

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초 록: 본 연구는 팬데믹 급성기(2020~2023) 동안 유튜브 중독에 영향을 미치는 요인의 변화를 메타분석을 통해 검토하였다. 선정된 연구자료의 이질성 검정 결과 I^2 =96.70%(p<.001)로 매우 높은 이질성이 확인되어 랜덤효과모형을 적용하였다. 분석 결과, 유튜브 중독 영향요인과의 전체 상관관계 효과크기는 r=.261(95% CI=.183~.330)로 유의한 정적 상관관계를 보였다. 연구 결과, 유튜브 중독 영향요인과의 전체 효과크기는 중간 수준의 정적 상관관계(r=.261)를 나타냈다.국가별 평균 효과크기는 대한민국이 0.323(95% CI [0.231, 0.415])로 가장 높게 나타났으며, 프랑스는 0.137(95% CI [-0.018, 0.291]), 다국가(Multinational) 0.215(95% CI [0.005, 0.425])로 나타나 통계적으로 유의하지 않았다. 연령별 분석에서는 청소년 집단의 효과크기(ES=.350)가 성인 집단(ES=.239)보다 상대적으로 크게 나타났으나, 집단 간 차이는 통계적으로 유의하지 않았다(Qb=1.59, p=.208). 따라서 연령은 유튜브 중독과 영향요인 간 관계를 설명하는 유의한 조절변인으로 확인되지 않았다. 반면, 영향요인별 분석에서는 행동적 요인(ES=0.348)이 가장 높은 효과크기를 보였으며, 기술적 요인(ES=0.338), 심리적 요인(ES=0.207), 사회적 요인(ES=0.198) 순으로 나타났다. 이는 행동적 특성과 추천 알고리즘, 서비스 특성과 같은 기술적 특성이 유튜브 중독과 상대적으로 높은 관련성을 보인다는 점을 시사하고 있다. 따라서 유튜브 중독을 이해하고 예방하기 위해서는 다양한 영향요인을 통합적으로 고려하는 접근이 필요하다는 것을 나타낸다.

핵심어: 유튜브 중독, 메타분석, 유튜브중독 영향요인, 팬데믹 급성기, 개인심리적 요인, 사회행동적 요인

Abstract: This study examined changes in factors affecting YouTube addiction during the acute phase of the pandemic (2020-2023) through meta-analysis. As a result of the heterogeneity test of the selected research data, I^2 =96.70% (p<.001), a very high heterogeneity was confirmed, so a random effect model was applied. As a result of the analysis, the overall correlation effect size with the factors influencing YouTube addiction was r=.261 (95% CI=.183~.330), showing a significant positive correlation. As a result of the study, the overall effect size with the factors influencing YouTube addiction showed a moderate positive correlation (r=.261). The average effect size by country was the highest in Korea at 0.323 (95% CI [0.231, 0.415]), and in France, it was 0.137 (95% CI [0.018, 0.291]) and multinational 0.215 (95% CI [0.005, 0.425]), which were not statistically significant. In the age-specific analysis, the effect size (ES=.350) of the youth group was relatively larger than that of the adult group (ES=.239), but the difference between the groups was not statistically significant (Qb=1.59, p=.208). Therefore, age was not identified as a significant modulating variable explaining the relationship between YouTube addiction and influencing factors. On the other hand, in the analysis by influencing factor, the behavioral factor (ES=0.348) showed the highest effect size, followed by the technical factor (ES=0.338), the psychological factor (ES=0.207), and the social factor (ES=0.198). This suggests that technical characteristics such as behavioral characteristics, recommendation algorithms, and service characteristics are relatively highly related to YouTube addiction. Therefore, in order to understand and prevent YouTube addiction, an approach that considers various influencing factors in an integrated manner is necessary.

Keywords: YouTube addiction, meta-analysis, YouTube addiction influencing factors, pandemic acute phase, personal psychological factors, social behavioral factors

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1. 서론

유튜브(YouTube)는 정보 탐색, 학습, 오락, 사회적 상호작용 등 다양한 기능을 제공하며 전 세계적으로 가장 널리 이용되는 플랫폼 중 하나이다. 특히 코로나19 팬데믹 이후 비대면 활동으로 온라인 콘텐츠 소비가 급격히 증가하였고, 유튜브 이용시간과 의존 수준 또한 크게 확대된 것으로 보고되고 있다. 유튜브 플랫폼은 접근성이 높고 다양한 콘텐츠를 제공한다는 점에서 긍정적인 기능을 수행하지만, 과도한 의존은 학업 및 직무 수행 저하, 수면장애, 사회적 관계 약화, 심리적 문제 등 다양한 부정적 결과를 초래할 수 있어 사회적 관심이 증가하고 있다[1]. 따라서 유튜브 중독을 행위중독(behavioral addiction) 관점에서 바라보는 체계적인 연구가 필요하다. 행위중독은 특정 물질이나 행동에 대한 통제력 상실과 반복적 사용으로 인해 개인의 일상생활에 부정적 영향을 초래하는 상태로 정의되고 있다. 최근 인터넷, 게임, SNS, 스마트폰 중독과 같은 디지털 기반 행위중독에 대한 관심이 높아지면서 유튜브 이용 역시 행해중독의 관점에서 논의되고 있다[2, 3]. 행위중독은 물질중독처럼 인간의 뇌에 특정물질이 작용하여 신경적응 단계를 거침으로써 내성과 금단요인이 발현되는 기전이 아니라, 인간행동이 중독 매개체가 되는 특징이 있다[4, 5]. 도박 중독, 인터넷중독, 게임중독, 관계 중독, 성 중독, 그리고 운동 중독 등과 같은 다양한 분야에 적용되고 있는 개념이다[2].

유튜브 중독은 사용자가 유튜브 시청을 스스로 조절하지 못하고 과도하게 이용함으로써 학업, 직장생활, 대인관계 및 심리적 적응에 부정적인 영향을 경험하는 상태로 정의할 수 있다. 특히 유튜브의 자동재생 기능, 개인화 추천 알고리즘, 실시간 상호작용 기능은 사용자의 지속적인 시청을 유도함으로써 중독적 이용을 강화하는 요인으로 지적되고 있다[4, 5]. 연구에서는 유튜브 중독에 영향을 미치는 요인을 사회적 요인, 심리·행동적 요인 및 기술적 요인으로 구분하여 설명하고 있다. 심리적 요인에는 우울, 불안, 스트레스, 외로움, 자아존중감 등이 포함되며, 부정적 정서를 경험하는 개인일수록 유튜브 이용을 통해 심리적 보상과 정서적 안정을 추구하는 경향이 높은 것으로 보고되었다[5]. 사회적 요인으로는 사회적 지지, 대인관계, 소속감, 사회적 고립 등이 제시되며, 현실 세계에서의 사회적 욕구가 충족되지 못할 경우 온라인 플랫폼 이용이 증가할 수 있는 것으로 보고되고 있다[7]. 행동적 요인은 이용시간, 사용빈도, 습관적 이용, 몰입경험 등과 관련되며, 반복적인 이용 행동이 강화될수록 중독 레벨이 증가하는 것으로 보고되고 있다[8]. 또한 기술적 요인은 플랫폼 접근성, 사용 편의성, 추천 알고리즘, 자동재생 기능 등과 관련되며, 플랫폼 자체의 설계 특성이 사용자의 지속적 이용을 촉진하는 중요한 요인으로 제시되고 있다[5]. 그렇지만 지금까지 수행된 유튜브 중독 관련 다수의 연구에서 연구대상, 국가, 연령 및 측정도구가 상이하여 결과가 일관되지 않은 한계를 보이는 연구사례도 다수 발견된다. 일부 연구에서는 심리적 요인이 가장 강력한 영향요인으로 보고된 반면, 다른 연구에서는 이용행태나 플랫폼 특성이 더 중요한 설명요인으로 제시되기도 하였다. 또한, 연구결과가 개별 연구 수준에 머물러 있어 유튜브 중독과 영향요인 간 관계의 전체적인 효과크기를 종합적으로 파악하는 데에는 한계가 존재한다. 이러한 한계를 보완하기 위해서는 개별 연구결과를 통합하여 전체 효과크기를 산출하고, 영향요인별 차이를 체계적으로 검증할 수 있는 메타분석 연구가 필요하다[9].

메타분석은 동일 주제를 다룬 개별 연구들의 결과를 통계적으로 통합하여 보다 객관적이고 신뢰성 있는 결론을 도출하는 연구방법이다[10]. 특히 연구 간 효과크기를 종합적으로 산출하고 조절변인의 영향을 분석할 수 있어[10] 유튜브 중독 관련 연구결과를 체계적으로 정리하는 데 적합한 연구방법으로 평가된다.

다수의 연구에서 코로나19 팬데믹은 사회적 거리두기, 원격수업, 재택근무 등의 확산으로 온라인 미디

어 이용 시간을 크게 증가시킨 것으로 보고되었다. 특히 유튜브는 정보 획득, 오락, 학습 및 사회적 교류를 위한 주요 플랫폼으로 활용되었으며, 이러한 환경 변화는 유튜브 이용행태의 변화를 촉진하고 과도한 이용 및 중독 위험성을 증가시키는 요인으로 작용하였다. 따라서 본 연구에서는 코로나19 팬데믹 이전 시기의 유튜브 중독 영향요인을 분석한 기준선 연구의 후속 연구로써 팬데믹 급성기(2020~2023년)에 수행된 연구들을 대상으로 메타분석을 실시하였다. 팬데믹 급성기는 온라인 활동 의존도가 급격히 증가한 특수한 사회·환경적 시기로써 유튜브 중독 관련 영향요인의 효과크기 또한 이전 시기와 다른 양상을 보일 가능성이 있어 해당 시기에 축적된 연구결과를 종합적으로 검토할 필요가 있다. 따라서 본 연구에서는 코로나19 팬데믹 급성기에 수행된 유튜브 중독 관련 연구를 대상으로 메타분석을 실시하고자 한다. 유튜브 중독과 영향요인 간의 전체 효과크기를 확인하고, 국가, 연령 및 영향요인 범주에 따른 효과크기의 차이를 검증함으로써 팬데믹 급성기 환경에서 나타난 유튜브 중독의 특성을 규명하고자 한다. 이를 통해 유튜브 중독의 주요 영향요인을 통합적으로 파악하고, 향후 유사한 사회·환경적 위기 상황에서 유튜브 중독 예방을 위한 근거기반 정책 수립 및 개입 전략 마련에 필요한 기초자료를 제공하고자한다.

2. 이론적 배경

2.1. 유튜브중독 영향요인

유튜브의 과도한 이용은 단순한 사용 증가를 넘어 중독적 행동으로 발전할 수 있다[11, 12]. 유튜브 중독은 이용자가 플랫폼 사용을 스스로 조절하지 못하고 반복적으로 시청하거나 콘텐츠를 탐색함으로써 학업, 직업, 대인관계 및 일상생활에 부정적인 영향을 경험하는 상태로 정의한다[2, 13]. 유튜브는 Facebook, Instagram, TikTok과 같은 일반적인 소셜네트워크서비스(SNS)와 달리 동영상 기반의 콘텐츠 소비와 추천 알고리즘 중심의 플랫폼이라는 특징을 가진다. 일반적인 SNS가 대인관계 형성, 사회적 상호작용 및 자기표현 기능에 초점을 두는 반면, 유튜브는 이용자의 시청 이력과 선호도를 기반으로 개인화된 콘텐츠를 지속적으로 제공함으로써 장시간의 몰입적 이용을 유도한다[3]. 이러한 현상은 특정 물질을 섭취하지 않더라도 반복적 행동 자체에 의존성이 형성된다는 점에서 행위중독(behavioral addiction)의 범주에서 설명된다[3]. 행위중독은 물질중독처럼 인간의 뇌에 특정물질이 작용하여 신경적응 단계를 거침으로써 내성과 금단요인이 발현되는 기전이 아니라, 인간행동이 중독 매개체가 되는 특징이 있다[1]. Griffiths(2005)는 행위중독의 핵심 요소로 현저성(salience), 기분변화(mood modification), 내성(tolerance), 금단(withdrawal), 갈등(conflict), 재발(relapse)을 제시하였으며, 유튜브 중독 역시 이러한 특성을 공유하는 것으로 보고되고 있다[3]. 특히 유튜브는 개인 맞춤형 추천 알고리즘과 자동재생 기능을 기반으로 사용자의 지속적인 시청을 유도하기 때문에 중독적 이용 가능성이 높다는 평가를 받고 있다[5,13,14]. 특히 Balakrishnan & Griffiths(2017)는 유튜브 이용이 오락과 정보추구를 넘어 현실 문제로부터의 도피와 정서 조절 수단으로 활용될 경우 중독 위험성이 증가할 수 있다고 보고하였다[16].

2.1.1 심리적 영향요인

유튜브 중독에 영향을 미치는 요인은 크게 심리적 요인, 사회환경적 요인으로 구분할 수 있다. 심리적 요인의 우울, 불안, 외로움 및 스트레스는 디지털 미디어 중독을 설명하는 대표적 개인요인 변수이다[13]. 보상결핍이론(Reward Deficiency Theory)에 따르면 개인은 부정적 정서를 완화하거나 심리적 만족을 얻기 위해 특정 행동을 반복할 수 있으며, 이러한 과정이 지속될 경우 중독적 행동으로 발전할 수 있다[17]. 실제로 코로나19 팬데믹 시기 사회적 고립과 미래에 대한 불확실성은 개인의 심리적 부담을

증가시켰으며, 이러한 부정적 정서를 해소하기 위한 수단으로 온라인 동영상 플랫폼 이용이 증가한 것으로 보고되었다[12]. 우울과 스트레스 수준이 높을수록 인터넷 및 스마트폰 중독 수준이 증가하는 경향이 확인되었으며[15], 이러한 결과는 유튜브 중독 연구에서도 유사하게 나타나고 있다. 개인의 자기조절 능력과 성격 특성은 유튜브 중독의 중요한 영향요인이다[13, 15]. 자기통제력이 낮은 사람은 즉각적인 만족을 추구하는 경향이 강하며 충동을 효과적으로 조절하지 못하기 때문에 중독 행동에 취약할 가능성이 높다[18, 19]. Tangney 등(2007)은 자기통제력이 높은 개인일수록 학업성취와 심리적 적응 수준이 높고 다양한 중독 행동의 위험이 낮다고 보고하였다[19]. 반면 자기통제력이 부족한 경우 온라인 콘텐츠 이용 시간이 증가하고 사용 행동을 중단하기 어려운 경향이 나타난다. 또한 자아존중감과 자기효능감은 중독 행동을 감소시키는 보호 요인으로 알려져 있으며[20], 자아존중감이 낮은 개인은 현실에서 충족되지 못한 욕구를 온라인 활동을 통해 보상받으려는 경향을 보일 수 있다[16, 17].

2.1.2 사회문화적 영향요인

사회적 환경 역시 유튜브 중독에 영향을 미치는 주요 변인이다[4, 5]. 사회적 지지 이론(Social Support Theory)에 따르면 가족, 친구 및 주변인으로부터 제공되는 정서적·도구적 지지는 스트레스를 완충하고 심리적 적응을 촉진하는 역할을 수행한다[19, 21]. 충분히 사회적 지지를 경험한 개인은 부정적 정서를 효과적으로 관리할 수 있는 반면, 사회적 고립이나 대인관계 문제를 경험한 개인은 온라인 공간을 대체적 관계 형성의 장으로 활용할 가능성이 높다[23]. Moon(2019) 사회불안 수준이 높은 사람일수록 인터넷 의존 경향이 증가한다고 보고하였으며, 이는 유튜브 이용에서도 유사하게 적용될 수 있다. 연령에 따른 차이도 중요한 영향요인이다[4]. 청소년과 대학생은 디지털 기기 활용 빈도가 높고 또래 관계 형성과 자아정체성 발달이 중요한 시기에 해당하기 때문에 미디어 중독에 상대적으로 취약한 집단으로 평가된다[5]. 특히 청소년은 자기조절 능력이 충분히 발달하지 않은 상태에서 다양한 온라인 콘텐츠에 노출되기 때문에 중독 위험이 높을 수 있다. 반면 성인은 직업적 책임과 사회적 역할에 따라 이용 목적과 사용 방식이 달라질 수 있으며, 유튜브 이용 동기 역시 정보획득과 자기계발 중심으로 나타나는 경우가 많다. 따라서 연령집단에 따라 유튜브 중독의 영향요인과 효과크기에 차이가 존재할 가능성이 있으며[25, 26], 이에 대한 분석이 필요하다.

최근의 유튜브 중독 연구에서는 개인의 심리적 특성뿐만 아니라 사회문화적 환경의 중요성이 강조되고 있다. 문화·심리학 관점에 따르면 개인의 행동과 가치관은 자신이 속한 사회의 문화적 규범과 긴밀하게 연결되어 있으며, 디지털 미디어 이용행태 역시 문화적 맥락의 영향을 받는다[15, 16, 21]. Hofstede(2001)는 국가 간 문화 차이를 설명하기 위해 개인주의와 집단주의 차원을 제시하였는데, 대한민국은 집단주의 성향이 강한 사회로 분류되며 프랑스는 대표적인 개인주의 사회로 평가하였다[11]. 이러한 문화적 차이는 스트레스 경험 방식과 정서 조절 전략, 사회적 관계 형성 및 디지털 미디어 이용 동기에 영향을 미칠 수 있다. 실제로 인터넷 중독 관련 연구에서는 개인주의 문화와 집단주의 문화 간에 중독 수준과 영향요인의 차이가 존재하는 것으로 보고되었다[11,12]. 특히 코로나19 팬데믹 급성기에는 사회적 거리두기, 원격수업 및 비대면 소통 확대라는 공통된 환경 변화가 발생하였으나, 국가별 문화적 특성과 사회적 대응 방식에 따라 개인이 경험하는 심리적 부담과 온라인 플랫폼 이용 양상은 다르게 나타날 수 있다[13]. 따라서 유튜브 중독과 영향요인 간 관계가 문화적 맥락에 따라 어떠한 차이를 보이는지 확인하는 것은 해당 현상의 보편성과 특수성을 이해하는 데 중요한 의미를 가진다 할 수 있다. 유튜브 중독은 심리적 요인, 개인적 특성, 사회적 환경 및 문화적 요인이 복합적으로 작용하여 형성되는 것으로 나타나고 있다[15]. 그렇지만 다수의 유튜브중독 관련 연구들은 영향요인의 종류와 연구대상, 측정도구 및 국가적 배경에 따라 상이한 결과를 보고하고 있어 개별 연구 결과만으로는 일관된 결론을 도출하기 어려운 측면이 있다[11, 12]. 따라서 동일한 주제를 다룬 연구결과를 통합적으로 분석하여 전체

효과크기를 산출하고 조절효과를 검증할 수 있는 메타분석[10]을 통해 유튜브 중독 영향요인의 상대적 중요성을 규명할 필요가 있다. 특히 국가별 효과크기 차이를 비교함으로써 코로나19 이후 유튜브 중독 영향요인의 문화적 특성을 보다 체계적으로 이해할 수 있을 것으로 기대된다. 연구 간 이질성을 고려한 메타분석을 통해 통합적 효과크기를 추정함으로써 유튜브 중독에 대한 보다 다면적인 이해가 가능할 것으로 판단된다.

2.2. 유튜브중독 영향요인에 관한 메타분석 연구

메타분석은 동일하거나 유사한 주제를 다룬 개별 연구들의 결과를 통계적으로 통합하여 보다 객관적이고 일반화 가능한 결론을 도출하는 연구방법이다[22]. 전통적인 문헌고찰이 연구자의 주관적 판단에 의존하는 경향이 있는 반면, 메타분석은 각 연구에서 보고된 효과크기를 표준화하여 종합함으로써 연구결과의 일관성과 크기를 정량적으로 평가할 수 있다는 장점을 가진다[9]. 특히 사회과학 및 행동과학 분야에서는 동일한 변수 간 관계를 분석한 연구라 하더라도 표본 특성, 측정도구, 연구설계 및 수행 국가에 따라 상이한 결과가 보고되는 경우가 많다. 이러한 연구 간 불일치 문제는 특정 현상에 대한 일반적 결론을 도출하는 데 어려움을 초래한다[9]. 따라서 메타분석은 다수 연구의 결과를 통합하여 전체 평균 효과크기를 산출할 수 있을 뿐 아니라 연구 간 이질성(heterogeneity)을 검증하고, 조절변인(moderator)의 영향을 분석할 수 있다는 점에서 중요한 연구방법으로 평가된다[22]. 행위중독 원리 규명과 진단에 관한 연구는 인지심리 및 인간행동학, 그리고 임상학 등이 복합적으로 검토되는 학문영역이다. 행위중독은 인물의 행동・심리적 특성, 인물이 처해있는 사회・환경적 요인에 많은 영향을 받으며, 행위중독 경험에는 개인차가 나타난다[14]. 유튜브 중독 관련 연구도 예외는 아니며, 국가, 연령, 문화적 배경 및 측정 도구에 따라 다양한 결과가 보고되고 있다. 일부 연구에서는 우울과 스트레스가 유튜브 중독의 주요 예측요인으로 나타난 반면, 다른 연구에서는 사회적지지 또는 자기통제력이 큰 영향을 미치는 것으로 보고되었다. 코로나19 팬데믹 이후 비대면 환경의 확산으로 유튜브 이용이 증가하면서 유튜브 관련 연구는 축적되었지만, 개별 연구결과 간 차이로 인해 개별 요인의 통계적 유의성과 효과의 크기를 일관되게 규명하는 데 한계가 있다. 따라서 본 연구는 메타분석을 통해 코로나 19 팬데믹 급성기에 수행된 유튜브 중독 관련 연구를 대상으로 전체 효과크기를 종합적으로 산출하고, 국가와 연령 및 영향요인 유형에 따른 차이를 검증하고자 한다. 특히 문화적 맥락 및 개인・사회적 특성이 유튜브 중독과 영향요인에 미치는 영향 탐색을 통해 유튜브 중독 현상의 보편성과 문화적 특수성을 다면적으로 이해할 수 있을 것으로 기대한다[8,11]. 연구결과는 관련 분야 이론 정립 및 정책적 전략을 구축하는 데 기여할 수 있을 것이다.

3. 연구방법

3.1. 문헌검색

본 연구에서는 메타분석을 통해 코로나 팬데믹 이후 유튜브 중독에 영향을 미치는 요인의 구조 변화를 추적하고자 한다. 코로나팬데믹 급성기 2020년부터 2023년까지 출판된 연구중 유튜브 중독으로 검색된 논문을 분석대상으로 설정하였다. 검색은 대학도서관 원문정보시스템(KISS), 한국교육학술정보원(KERIS), Pubmed 등을 통해 실시하였다. 단순 문헌고찰 연구, 상관관계 수치가 없는 연구, 메타분석 연구 등은 제외하였다.

3.2. 연구자료 선정과정

연구자료 선정과정은 유튜브 중독 관련 연구, 학술지 게재 논문, 효과크기 산출이 가능한 연구 논문으

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로 한정하였다. 본 연구에서는 Uses and Gratifications Theory와 I-PACE 모델[15]을 바탕으로 유튜브 중독 영향요인을 심리・행동・사회・기술 요인으로 분류하였다. 중복 연구, 효과크기 산출이 불가능한 연구, 비학술 자료는 제외하였다. 제외 기준은 실증데이터 없이 이론만 제시한 연구, 상관계수 산출이 불가능한 연구를 제외하였다. 이 기준은 기존 메타분석 방법론(Borenstein et al., 2011)에 근거하여 설정하였다[9]. 선정된 국내외 48편 논문중 최종 11편을 선정하였다〈Table 1〉. 효과크기 산출이 가능한 연구, 만을 포함하고, 특정 기간(팬데믹 급성기)을 엄격히 적용한 결과이다.

〈Table 1〉 Characteristics of Studies Included in the Meta-Analysis

Author (Year)	Country	Sample Size (N)	Age Group	Major Predictor Variables
Pierre de Bérail et al. (2019)	France	932	Adults	Social Anxiety, Parasocial Relationships, Loneliness
Kircaburun et al. (2019)	Multi-country	387	Adults	Depression, Loneliness, YouTube Use
Lee (2019)	South Korea	165	Adults	Personality Traits, Perceived Usefulness, Social Influence
Lee et al. (2021)	South Korea	212	Adults	Motivation, Usefulness, Subscription Satisfaction
Jung & Kim (2021)	South Korea	320	Adolescents	Internalizing Problems, Externalizing Problems, Social Support
Pierre de Bérail & Bungener (2022)	France	370	Adolescents	Psychological Characteristics, Content Characteristics, Parasocial Preference
Bachnio et al. (2023)	Multi-country	2,193	Adults	Self-Control, Media Multitasking
Chun & Lee (2022)	South Korea	377	Adults	Perceived Complementarity, Perceived Compatibility
Kim & Jung (2022)	South Korea	88-200	Adolescents & Adults	Viewing Attitude, Behavioral Intention, Channel Loyalty
Kang et al. (2023)	South Korea	249	Adults	Service Quality, Usage Capability

Note. N = sample size. A total of 11 studies yielding 50 effect sizes were included in the meta-analysis.

최종 선정된 논문의 효과크기는 Fisher’s z 변환 후 분석을 진행하였다. 랜덤효과 모형(REML)을 사용하여 전체 효과크기를 산출하였고, Q 및 I^2 값을 통해 이질성을 평가하였다. 출판편향은 Funnel Plot과 Egger’s test를 기반으로 검정하였다. 효과크기는 Hedges의 g로 환산한 뒤 R의 랜덤효과모형(REML)을 적용하여 분석하였다. 연구 간 이질성은 Q 통계량과 I^2 지표로 검증하였으며, 출판편향은 Funnel plot과 Egger 회귀검정을 활용하여 확인하였다.

3.3. 코딩 및 분석

3.3.1. 코딩절차

본 연구에서는 Cooper, H. (2017)가 제시한 메타분석 절차[9]에 의해 유튜브중독 관련 변인들에 대한 코딩을 진행하였다[23]. 메타분석 결과에 과도한 영향을 미치는 연구를 확인하기 위해 표준화 잔차, Cook’s distance 및 leave-one-out 분석방법을 사용하여 이상치를 검토하였다. 본 연구에서는 코로나 팬데믹 급성기인 2020년부터 2023년까지 출판된 논문중 유튜브 중독으로 검색된 논문 48편의 연구물 중 11편을 선정하여 코딩을 실시하였다. 분석대상 연구 중 대한민국이 가장 높은 비중을 차지하였으며, 프랑스가 두 번째로 많은 연구가 확인되었다. 반면 다른 국가들은 연구 수가 제한적이어서 독립적인 국가 범주로 분석하기 어려웠다. 이에 따라 통계적 안정성과 비교 가능성을 확보하기 위하여 대한민국과 프랑스를 개별 국가 범주로 설정하고, 그 외 국가들은 다국가 범주로 통합하여 분석하였다. 대한민국과 프랑스는 문화적・사회적 배경이 상이한 국가로서 유튜브 중독 영향요인의 문화적 차이를 탐색할 수 있다는 점에서도 비교의 의의가 있다고 판단하였다.

3.3.2. 출판편향 검토

메타분석에서는 책상서랍문제(file drawer problem)와 출판편향(publication bias)이 존재할 경우 전체 효과크기가 과대추정되어 연구결과의 타당성이 저해될 수 있다[23, 24]. 특히 출판편향은 통계적으로 유의한 결과를 보고한 연구가 비유의한 결과를 보고한 연구보다 출판될 가능성이 높아 메타분석 결과의 신뢰성을 위협하는 요인으로 알려져 있다[10]. 따라서 본 연구에서는 효과크기 분석에 앞서 연구결과의 타당성을 확보하기 위하여 책상서랍문제와 출판편향을 검증하였다. 책상서랍문제는 Rosenthal의 Fail-safe N과 Orwin의 Fail-safe N 방법을 사용하여 검토하였으며[23, 24], 출판편향은 Egger의 절편검정(Egger's regression test)과 Duval과 Tweedie(2000)의 Trim-and-Fill 방법[24]을 활용하여 분석하였다. 모든 메타분석은 R 프로그램을 사용하여 수행하였다. 출판편향 검증을 위하여 첫째, Funnel Plot을 통해 효과크기와 표준오차(standard error, SE)의 분포가 대칭적인지 시각적으로 확인하였다. 둘째, Egger's regression test를 실시하여 출판편향의 존재 여부를 통계적으로 검증하였고, 셋째, 누락된 연구의 존재를 추정하고, 보정된 효과크기를 재산출함으로써 출판편향이 연구결과에 미치는 영향을 평가하였다[24]. 분석에서는 funnel plot에서 비교적 완만한 비대칭성이 관찰되었지만, Egger 검정 결과는 통계적으로 유의하지 않는 것으로 나타나 출판편향 가능성은 크지 않은 것으로 판단하였다.

3.3.3. 코딩 신뢰도 및 분석 신뢰성 검토

본 연구에서는 코딩 일치도를 확인하기 위한 Cohen's κ는 .91로 매우 높았다. 이는 분석 신뢰도를 확보하는 데 중요한 근거가 된다[26]. 또한, 감도 분석(sensitivity analysis)을 통해 특정 연구 제거시 효과크기 변화 여부를 확인하였으며, 전체적인 효과 변동이 미미하여 분석이 안정적인 것으로 판단하였다[22].

4. 연구결과

4.1. 이질성 검정에 따른 분석모형 선택

본 연구 대상의 I^2 값이 96.70이 나타나 이질성이 높은 수준인 것으로 나타났다. 본 연구에서 나타난 높은 이질성은 연구가 수행된 사회·문화적 맥락, 대상 집단의 특성 등에 따라 다양하게 나타날 수 있음을 시사한다. 이에 따라 중재변인 분석과 메타회귀분석을 통해 이질성의 원인을 분석하였다. 본 연구에서는 이질성을 반영하여 랜덤효과 모형을 사용하였으며, sampling error와 random error를 모두 반영하여 결과를 도출하였다. 이질성 검정을 실시한 결과 이질성은 $Q(6)=222.188$, $p < .001$ 수준에서 유의하였으며, 개별 연구의 효과크기간 이질성이 있는 점을 반영하여 랜덤효과모형을 사용하여 결과를 도출하였다.

〈Table 2〉 Results of Heterogeneity Analysis

K	Q-value	p-value	I2	τ^2
11	1055.3776	0.000	96.70	0.0704

Note. k = number of studies; Q-value = heterogeneity statistic; p-value = significance level; I^2 = percentage of heterogeneity; τ^2 = between-study variance.

4.2. 출판편향 검증

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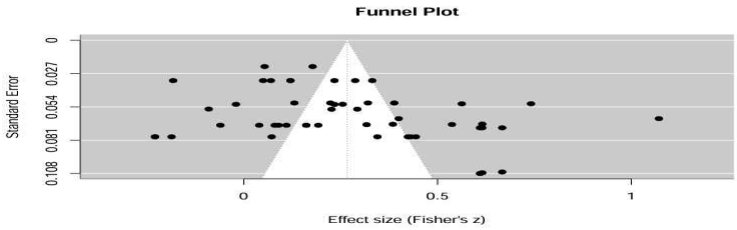
출판편향을 검증하기 위하여 Egger 회귀검정과 추정치 가감법(Trim and Fill)을 실시하였다[24]. 분석 결과, Egger 회귀검정은 통계적으로 유의한 것으로 나타나(z=2.102, p=.036) 출판편향 또는 소규모 연구 효과의 가능성이 일부 시사되었다. 그러나 Trim and Fill 분석 결과 보정이 필요한 누락 연구는 발견되지 않았으며(k_0=0), 관측된 효과크기(r=.261, 95% CI=.189~.330)와 보정된 효과크기(r=.261, 95% CI=.189~.330)가 동일하게 나타났다. 따라서 출판편향이 존재하더라도 본 연구의 전체 효과크기 추정에 미치는 영향은 매우 제한적인 것으로 판단된다.

〈Table 3〉 Results of the Trim and Fill Analysis

	Studies trimmed	ES	95% CI
Observed value	-	0.261	0.189-0.33
Adjusted value	0	0.261	0.189-0.33

Note. ES = effect size; 95% CI = 95% confidence interval.Egger test p-value: 0.0355 Number of imputed studies:0

Funnel plot을 시각적으로 검토한 결과, 일부 효과크기가 우측에 상대적으로 집중된 경향이 관찰되었으나 연구들이 전체 효과크기를 중심으로 대체로 대칭적으로 분포하는 것으로 나타났다[Figure 1].



[Figure 1] Funnel Plot of Effect Sizes

Egger 회귀검정에서는 통계적으로 유의한 결과가 나타나(z = 2.102, p = .036) 출판편향 가능성이 일부 제기되었다. Duval과 Tweedie(2000)의 Trim-and-Fill 분석 결과 누락된 연구는 추정되지 않았고(k_0 = 0), 보정 전후 효과크기 역시 동일하게 나타났다. 이에 따라 출판편향이 본 연구의 결과를 실질적으로 왜곡하였을 가능성은 낮은 것으로 판단된다.

4.3. 전체 효과크기 검증

본 연구에서는 코로나19 이후 유튜브 중독 관련 변인 간의 관계를 분석한 11편의 연구에서 추출한 총 50개의 효과크기를 대상으로 랜덤효과모형(Random-Effects Model)을 적용하여 전체 효과크기를 산출하였다. 분석 결과, 유튜브 중독과 영향요인 간의 전체 상관관계 효과크기는 r = .261로 나타났으며, 95% 신뢰구간은 [.189, .330]이었다. Cohen(1988)의 기준에 따르면 상관계수 효과크기 r = .10은 작은 효과(small effect), r = .30은 중간 효과(medium effect), r = .50은 큰 효과(large effect)에 해당한다[26]. 따라서 본 연구에서 확인된 전체 효과크기(r = .261)는 작은 효과와 중간 효과 사이의 수준으로 해석할 수 있다. 이는 유튜브 중독이 관련 영향요인과 유의한 관련성을 가지지만, 특정 단일 요인에 의해 설명되기보다는 개인적・심리적・사회적・기술적 요인이 복합적으로 작용하는 현상임을 시사한다. 또한 95% 신뢰구간에 0이 포함되지 않아 전체 효과크기는 통계적으로 유의한 것으로 나타났다(z = 6.921, p <.001).

〈Table 4〉 Overall Effect Size of YouTube Addiction Based on the Random-Effects Model

k	ES (z)	r	95% CI	z	p	Q(df)	I^2 (%)	τ^2

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50	0.267	0.261	[0.189, 0.330]	6.921	<.001	1055.38(49)***	96.70	0.070

Note. k = number of effect sizes; ES = effect size (Fisher's z); CI = confidence interval; Q = heterogeneity statistic; I^2 = percentage of heterogeneity; τ^2 = between-study variance. p < .001.

4.4. 국가별 구분에 따른 효과크기 분석

국가별 구분에 따른 효과크기의 차이를 검증하기 위하여 대한민국, 프랑스 및 다국가 연구를 조절변수로 포함한 메타회귀분석을 실시하였다〈Table 4〉. 국가별 평균 효과크기 분석 결과, 대한민국이 ES = 0.323 (95% CI [0.231, 0.415])으로 가장 높은 효과크기를 나타냈으며 통계적으로 유의하였다. 프랑스는 ES = 0.137 (95% CI [-0.018, 0.291])로 나타났으나 신뢰구간에 0이 포함되어 통계적으로 유의하지 않았다. 다국가(Multinational) 연구의 평균 효과크기는 ES = 0.215 (95% CI [0.005, 0.425])로 나타났으며 통계적으로 유의하였다(p = .045). 그러나 국가 간 조절효과 검정 결과는 통계적으로 유의하지 않은 것으로 나타났다(QB = 4.41, p = .111). 이는 국가 범주에 따른 평균 효과크기의 차이가 존재하는 경향은 있으나, 본 연구에서 분석된 국가 범주 간 차이를 통계적으로 확정하기에는 충분하지 않음을 의미한다. 유튜브 중독 관련 변인 간의 관계가 국가별 사회·문화적 환경에 따라 다르게 나타날 가능성을 시사한다. 다만 일부 국가의 경우 포함된 연구 수(k)가 제한적이므로 결과 해석에 주의가 필요하며, 향후 보다 많은 국가와 표본을 포함한 후속 연구가 필요하다.

〈Table 5〉 Comparison of Effect Sizes by Country

Country Category	k	ES(β)	SE	z	p	95% CI	Q_b(p)
Korea(Refernce)	33	0.323	0.047	6.90	.001	[0.231,0.415]	4.41 (.111)
France	11	0.137	0.079	1.73	.083	[-0.018, 0.291]	
Multinational	6	0.215	0.107	2.01	.045	[0.005, 0.425]	

Note. k = number of effect sizes; ES = effect size; 95% CI = 95% confidence interval; Qb = between-group heterogeneity statistic. A total of 50 effect sizes extracted from 11 studies were included in the analysis.

4.5. 연령구분에 따른 효과크기

연령구분에 따른 효과크기 차이를 확인하기 위하여 청소년 집단과 성인 집단을 대상으로 조절효과 분석을 실시하였다. 분석 결과, 성인 집단의 평균 효과크기는 0.239(95% CI=0.151~0.326, p<.001)로 나타났으며, 청소년 집단의 평균 효과크기는 0.350(95% CI=0.201~0.499, p<.001)로 나타나 두 집단 모두 유의한 정적 관계를 보였다. 유튜브 중독은 성인과 청소년 집단 모두에서 관련 영향요인과 유의한 상관관계가 있는 것으로 확인되었다. 효과크기의 크기를 비교해 보면 청소년 집단이 성인 집단보다 다소 높은 수준을 보였으나, 집단 간 효과크기 차이에 대한 검정 결과는 통계적으로 유의하지 않은 것으로 나타났다(Qb=1.59, p=.208). 따라서 연령구분은 유튜브 중독 관련 변인 간 관계를 설명하는 유의한 조절변인으로 확인되지 않았으며, 효과크기의 차이는 연령보다는 다른 개인적·환경적 특성에 의해 설명될 가능성이 있다.

〈Table 6〉 Effect Sizes by Age Group

Category	K	ES	p-value	95% CI	Q_b(p)
Adults	29	0.239	<.001	0.1514-0.3260	Qb:
Adolescents	21	0.350	<.001	0.2007-0.4987	1.59 (.208)

K=the number of effect sizes , ES=effect size,CI=confidence interval , Q_b=between groups homogeneity

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4.6. 유튜브 중독 영향 요인에 따른 효과크기

유튜브 중독 영향요인 범주에 따른 효과크기 차이를 확인하기 위하여 기술적 요인, 사회적 요인, 심리적 요인및 행동적 요인을 조절변수로 설정한 하위집단 분석을 실시하였다〈Table 7〉. 분석 결과, 모든 영향요인 범주에서 유튜브 중독과 유의한 정적 상관관계가 나타났다. 기술적 요인의 효과크기는 0.338(95% CI [0.188, 0.471], p<.001), 사회적 요인의 효과크기는 0.198(95% CI [0.014, 0.370], p=.035), 심리적 요인의 효과크기는 0.207(95% CI [0.096, 0.312], p<.001), 행동적 요인의 효과크기는 0.348(95% CI [0.184, 0.493], p<.001)으로 나타났다. Cohen(1988)의 기준에 따르면 모든 범주의 효과크기는 작은 효과에서 중간 효과 수준에 해당하였다. 효과크기의 상대적 크기를 비교한 결과 행동적 요인(ES=0.348)이 가장 높았으며, 기술적 요인(ES=0.338), 심리적 요인(ES=0.207), 사회적 요인(ES=0.198) 순으로 나타났다. 이는 이용시간, 사용빈도, 습관적 이용과 같은 행동적 특성과 추천 알고리즘, 플랫폼 접근성 등 기술적 특성이 유튜브 중독과 비교적 높은 관련성이 있음을 시사한다. 그러나 영향요인 범주 간 효과크기 차이에 대한 검정 결과는 통계적으로 유의하지 않은 것으로 나타났다(Qb=3.65, p=.301). 또한 영향요인 범주가 설명하는 이질성은 1.14%(R^2 =1.14%)에 불과하였다. 이는 유튜브 중독이 특정 범주의 영향요인에 의해 독립적으로 설명되기보다는 기술적・사회적・심리적・행동적 요인이 복합적으로 상호작용하는 현상임을 나타낸다. 따라서 유튜브 중독의 이해와 예방을 위해서는 특정 요인에 국한하기보다 다양한 영향요인을 통합적으로 고려할 필요가 있는 것으로 판단된다.

〈Table 7〉 Effect Sizes by YouTube Addiction Factors

Category	K	ES	SE	95% CI	p-value	Q_b(p)
Technical	11	0.338	0.082	0.188 - 0.471	<.001	
Social	8	0.198	0.095	0.014 - 0.370	.035	Qb:3.65
Psychological	22	0.207	0.058	0.096 - 0.312	<.001	(.301)
Behavioral	9	0.348	0.090	0.184 - 0.493	<.001	

K=the number of effect sizes , ES=effect size, CI=confidence interval, Q_b=between groups homogeneity

5. 논의 및 결론

본 연구는 코로나 팬데믹 급증기에 수행된 유튜브 중독 관련 연구들을 유튜브 중독과 영향요인 간의 관계를 검증하고, 국가, 연령구분 및 영향요인 범주에 따른 효과크기 차이를 확인하고자 하였다. 선정된 연구문헌에서 추출된 총 50개의 효과크기를 통합 분석한 결과, 유튜브 중독과 영향요인 간의 전체 평균 효과크기는 r = .159로 나타났다. Cohen(1988)의 기준은 작은 효과와 중간 효과 사이의 수준에 해당한다. 높은 이질성(I^2 = 97.76%)과 영향요인 범주 및 국가별 차이를 고려할 때, 유튜브 중독은 특정 단일 요인에 의해 설명되기보다는 개인의 심리적 특성, 사회적 관계, 행동적 특성 및 플랫폼 환경 등이 복합적으로 작용하는 다차원적 현상으로 이해할 수 있다. 또한, 전체 평균 효과크기가 통계적으로 유의하게 나타난 것은 기존 개별 연구에서 보고된 유튜브 중독 관련 영향요인의 효과를 통합적으로 뒷받침하는 결과로 해석할 수 있다. 그러나 연구 간 이질성은 매우 높은 수준으로 나타나(I^2 = 97.76%), 효과크기가 연구대상, 측정도구, 연구환경 및 분석 변인에 따라 크게 달라질 수 있음을 보여준다. 이는 유튜브 중독이 단일 요인에 의해 설명되기보다 심리적・사회적・행동적・기술적 요인이 상호작용하는 다차원적 현상임을 보여준다. 출판편향 검증 결과에서는 Funnel plot이 전반적으로 대칭적인 형태를 보였으며, Trim and Fill 분석에서도 누락된 연구가 발견되지 않았다. 비록 Egger 회귀검정에서는 통계적으로 유의한 결과가

나타나 출판편향 가능성이 일부 나타났으나, 보정 전후 효과크기가 동일하게 나타났다는 점에서 출판편향이 본 연구의 결과를 실질적으로 왜곡할 가능성은 낮은 것으로 판단된다. 이는 본 연구에서 도출된 효과크기의 신뢰성을 뒷받침하는 결과라 할 수 있다. 국가별 평균 효과크기는 대한민국 0.323(95% CI [0.231, 0.415]), 프랑스 0.137(95% CI [-0.018, 0.291]), 다국가 0.215(95% CI [0.005, 0.425])로 나타났다. 국가 변수가 설명하는 이질성은 5.05%로 제한적이었으며(R^2 =5.05%), 국가를 통제한 후에도 잔여 이질성이 유의하게 나타났다(QE(47)=891.54, p<.001). 따라서 국가에 따른 효과크기 차이는 통계적으로 유의하지 않은 것으로 판단하였다. 이는 유튜브 중독과 영향요인 간의 관계가 특정 국가나 연령집단에 국한된 현상이 아니라 비교적 보편적으로 나타나는 현상으로 해석할 수 있다. 연령구분에 따른 효과크기 차이를 확인하기 위하여 청소년 집단과 성인 집단을 대상으로 조절효과 분석을 실시하였다. 분석 결과, 성인 집단의 평균 효과크기는 0.239(95% CI [0.151, 0.326], $p < .001$), 청소년 집단의 평균 효과크기는 0.350(95% CI [0.201, 0.499], $p < .001$)으로 나타나 두 집단 모두 유의한 정적 관계를 보였다. 효과크기는 청소년 집단이 성인 집단보다 다소 높게 나타났으나, 집단 간 차이는 통계적으로 유의하지 않았다(QB = 1.59, p = .208). 이는 유튜브 중독과 영향요인 간의 관계가 청소년 집단에서 상대적으로 강하게 나타나는 경향은 있지만, 연령에 따라 효과크기가 유의하게 달라진다고 보기에는 충분한 근거가 부족함을 의미한다. 따라서 연령구분은 유튜브 중독 관련 변인 간 관계를 설명하는 유의한 조절변인으로 확인되지 않았으며, 효과크기의 차이는 연령보다는 개인적·환경적 특성 등 다른 요인에 의해 설명될 가능성이 있는 것으로 판단하였다. 영향요인 범주별 분석에서는 행동적 요인과 기술적 요인이 상대적으로 높은 효과크기를 보였으며, 사회적 요인과 심리적 요인 역시 유의한 정적 관계를 나타냈다. 이는 유튜브 중독이 이용시간, 사용빈도, 습관적 이용과 같은 행동적 특성뿐만 아니라 추천 알고리즘, 플랫폼 접근성 및 서비스 기능과 같은 기술적 환경과도 관련되어 있음을 시사한다. 그러나 영향요인 범주 간 효과크기 차이는 통계적으로 유의하지 않은 것으로 나타났다(QB = 3.65, p = .301). 이 결과는 유튜브 중독이 심리적·사회적·행동적·기술적 요인이 복합적으로 작용하는 다차원적 현상임을 보여준다. 이에 따라 유튜브 중독의 예방 및 개입을 위해서는 특정 요인에 대한 단편적 접근보다 다양한 영향요인을 통합적으로 고려하는 접근이 전략이 필요하다. 예방 프로그램 및 정책 수립 과정에서도 이러한 복합적 특성을 반영할 필요가 있다.

연구결과를 요약하면 다음과 같다. 유튜브 중독은 심리적·사회적·행동적·기술적 요인이 상호작용하여 형성되는 복합적 현상으로 이해할 필요가 있다. 따라서 유튜브 중독 예방 및 개입을 위해서는 특정 요인에만 초점을 두기보다 개인의 이용행태와 심리적 특성, 사회적 환경, 플랫폼의 기술적 특성을 함께 고려한 통합적 접근이 요구된다. 따라서 향후 연구에서는 더욱 다양한 국가와 연령층을 포함한 연구를 축적하고, 세분화된 영향요인 검증을 통해 유튜브 중독의 발생 기제와 효과적인 개입 방안을 더욱 구체적으로 규명할 필요가 있다. 본 연구는 향후 감염병 확산, 자연재해, 사회적 위기 등으로 인해 비대면 활동이 증가하는 상황에서 디지털 미디어 과의존 위험을 예측하고 대응하기 위한 근거자료로 활용될 수 있다. 본 연구 결과는 팬데믹이라는 특수한 상황을 넘어 현대 사회의 디지털 환경에서 유튜브 중독 예방 및 개입을 위한 근거기반 정책 수립에 유의미한 시사점을 제공한다. 이러한 결과에도 불구하고 본 연구는 다음과 같은 한계를 가진다. 첫째, 분석대상 연구들이 다양한 측정도구와 연구설계를 사용하고 있어 높은 이질성이 나타났으며, 이에 따라 결과 해석에 주의가 필요하다. 둘째, 분석대상 연구가 대한민국과 프랑스에 집중되어 있어 연구 결과를 모든 국가와 문화권으로 일반화하는 데 한계가 있다. 셋째, 본 연구는 팬데믹 급성기 연구를 대상으로 수행되었기 때문에 현재의 포스트 팬데믹 환경에서 동일한 효과크기가 유지되는지 직접적으로 확인하기 어렵다. 향후 연구에서는 팬데믹 이전, 팬데믹 급성기, 포스트 팬데믹 시기를 비교하는 종단적 메타분석이 필요하다. 향후 연구에서는 보다 많은 연구를 포함하여 국가, 연령 및 영향요인에 대한 조절효과 분석을 확대할 필요가 있다.

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AI Literacy and Creativity Among Chinese University Students: The Mediating Role of Grit and the Moderated Mediating Role of AI Anxiety

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중국 대학생들의 AI 리터러시와 창의성: 그릿의 매개효과와 AI 불안의 조절된 매개효과

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Abstract: AI literacy has become an important competence in higher education, yet its relationship with university students' creativity and the psychological conditions underlying this relationship remain insufficiently understood. This study tested a moderated mediation model among Chinese university students, with grit as the mediator and AI anxiety as the moderator of the grit-creativity relationship.Data were collected through an anonymous online survey, and 2,464 valid responses were retained. Exploratory factor analysis, confirmatory factor analysis, correlation analysis, and PROCESS macro Model 14 were used. The results showed that AI literacy positively predicted creativity both directly and indirectly through grit. AI anxiety significantly moderated the relationship between grit and creativity: the effect of grit was strongest when AI anxiety was low, remained significant at the mean level, and became non-significant when AI anxiety was high. The index of moderated mediation was significant, indicating that AI anxiety weakened the indirect effect of AI literacy on creativity through grit. These findings suggest that AI literacy may support creativity development, but its motivational pathway through grit is less likely to operate under high AI anxiety.

Keywords: AI literacy; creativity; grit; AI anxiety; moderated mediation; Chinese university student

초 록: 인공지능(AI) 리터러시는 고등교육에서 중요한 역량으로 부각되고 있으나, 대학생의 창의성과의 관계 및 이 관계가 작동하는 심리적 조건에 대해서는 아직 충분히 밝혀지지 않았다. 본 연구는 중국 대학생을 대상으로 그릿을 매개변수로, AI 불안을 그릿-창의성 관계의 조절변수로 설정한 조절된 매개모형을 검증하였다.자료는 온라인 익명 설문조사를 통해 수집되었으며, 최종적으로 2,464부의 유효 응답이 분석에 사용되었다.탐색적 요인분석, 확인적 요인분석, 상관분석 및 PROCESS macro Model 14를 적용하였다. 분석 결과, AI 리터러시는 창의성을 직접적으로 정적으로 예측할 뿐만 아니라 그릿을 통해 간접적으로도 예측하였다. 또한 AI 불안은 그릿과 창의성 간의 관계를 유의하게 조절하였다. 그릿의 효과는 AI 불안이 낮을 때 가장 강했으며, 평균 수준에서는 유의하게 유지되었으나, 높은 수준에서는 유의하지 않았다. 조절된 매개효과 지수도 유의하게 나타나, AI 불안이 AI 리터러시가 그릿을 통해 창의성에 미치는 간접효과를 약화시키는 것으로 확인되었다. 이러한 결과는 AI 리터러시가 창의성 발달을 지원할 수 있지만, 높은 AI 불안 수준에서는 그릿을 통한 동기적 경로가 약화될 수 있음을 시사한다.

핵심어: AI 리터러시; 창의성; 그릿; AI 불안; 조절된 매개효과; 중국 대학생

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1. Introduction

Artificial intelligence (AI) is reshaping higher education by changing how students access information, solve problems, complete academic tasks, and generate ideas. In this context, AI literacy has become an important competence that goes beyond technical knowledge and includes the ability to understand, use, evaluate, and engage with AI responsibly. Creativity is also a central goal of higher education because students are increasingly expected to generate novel and useful ideas in complex learning and social environments. In this study, creativity refers to university students' innovation ability to generate novel and useful ideas, approaches, and solutions in academic learning contexts.

Existing research has clarified the conceptual foundations of AI literacy and creativity. AI literacy has been described as a multidimensional competence involving AI knowledge, application, evaluation, creation, and ethical awareness [1-3]. Creativity research has emphasized originality, usefulness, knowledge resources, motivation, and supportive environments [4,5]. Recent studies have also linked AI literacy to AI self-efficacy, AI-supported output quality, and creativity-related outcomes [6,7]. However, less is known about the psychological mechanism through which AI literacy is associated with creativity among university students.

Grit may be one such mechanism. Grit refers to perseverance and passion for long-term goals [8,9]. Creative work often requires sustained exploration, revision, tolerance of failure, and long-term effort rather than only sudden inspiration. Recent studies have shown that grit or perseverance of effort is related to creativity in educational contexts [10-12]. At the same time, students with higher AI literacy may experience stronger AI self-efficacy and competence in AI-supported learning [6]. From a social cognitive perspective, perceived competence can support persistence in challenging tasks [18], which provides a theoretical basis for examining grit as a motivational pathway. Therefore, AI literacy may be associated with grit, and grit may help students transform AI-supported learning opportunities into creative outcomes.

AI anxiety may further condition this process. AI anxiety refers to negative emotional responses associated with AI use, AI-related uncertainty, and perceived consequences of AI. Wang and Wang [13] showed that AI anxiety is related to motivated learning behavior, while Helali et al. [14] conceptualized ethical AI dilemma anxiety as psychological distress arising from moral uncertainty about AI use in academic contexts. In the present model, AI anxiety is treated as a boundary condition that may weaken the extent to which grit is translated into creativity. When AI anxiety is high, students may continue to make efforts, but concerns about academic integrity, privacy, AI dependence, or future competence may reduce confidence, psychological safety, and creative exploration.

Although prior studies have examined AI literacy, grit, and creativity-related constructs, limited attention has been paid to the specific moderated mediation mechanism linking AI literacy, grit, AI anxiety, and creativity. A related study has examined AI literacy, grit, and creative convergence capabilities among nursing students, but it did not test AI anxiety as a moderator of the grit-creativity pathway. The present study therefore proposes a model in which AI literacy predicts creativity directly and indirectly through grit, while AI anxiety moderates the relationship between grit and creativity. This model integrates an AI-related competence, a motivational trait, an emotional boundary condition, and creativity in one framework.

This study is also aligned with current educational policy. Globally, UNESCO [15] emphasizes

preparing students as responsible users and co-creators of AI. In China, the Education Powerhouse Construction Plan Outline (2024-2035) [16] and the "AI + Education" Action Plan [17] emphasize digital education, AI-supported transformation, intelligent literacy, innovative thinking, complex problem solving, and the cultivation of top innovative talent. Against this background, this study asks: (1) Is AI literacy positively associated with creativity among Chinese university students? (2) Does grit mediate this relationship? (3) Does AI anxiety moderate the grit-creativity relationship and further condition the indirect effect of AI literacy on creativity through grit? By testing this model, the study contributes to AI education research by clarifying a motivational pathway and an emotional boundary condition for creativity in a Chinese higher education context.

2. Theoretical Background and Hypotheses Development

2.1 The Relationship Between AI Literacy and Creativity

2.1.1 Definitions of AI Literacy and Creativity

AI literacy is generally understood as a multidimensional competence rather than a narrow technical skill. Long and Magerko [1] defined AI literacy as a set of competencies that enables individuals to critically evaluate AI technologies, communicate and collaborate effectively with AI, and use AI as a tool across different contexts. Ng et al. [2] further conceptualized AI literacy as including knowledge and understanding of AI, use and application of AI, evaluation and creation with AI, and ethical consideration of AI-related issues. In this study, AI literacy refers to students' affective, behavioral, cognitive, and ethical readiness to understand, use, evaluate, and engage responsibly with AI.

Creativity is also a multidimensional construct. Runco and Jaeger [4] argued that creativity requires both originality and effectiveness; creative ideas should be novel as well as appropriate or useful. Amabile [5] defined creativity as the production of novel and appropriate ideas, products, or solutions, and emphasized domain-relevant skills, creativity-relevant processes, task motivation, and the social environment as key components. In this study, creativity refers to university students' innovation ability to generate novel and useful ideas, approaches, and solutions in academic learning contexts.

2.1.2 AI Literacy and Creativity

AI literacy may be positively associated with students' creativity because it provides cognitive, practical, and ethical resources for creative learning. According to AI literacy frameworks, AI-literate students are expected not only to understand basic AI concepts but also to use AI tools, evaluate AI-generated outputs, and recognize ethical implications [1,2]. These capacities are relevant to creativity because creative work requires access to diverse information, flexible recombination of knowledge, critical evaluation of alternatives, and the production of novel and useful outcomes [4,5].

Recent empirical research also provides indirect support for this relationship. Bećirović et al. [6] found that university students' AI technical understanding and practical AI application significantly predicted AI self-efficacy and AI-supported output quality. Although these outcomes are not identical

to creativity, they suggest that AI literacy may strengthen students' confidence, problem-solving capacity, and ability to use AI-supported resources effectively. In higher education, students with stronger AI literacy may be better positioned to use AI for idea generation, information comparison, solution refinement, and knowledge integration.

However, this relationship should be interpreted cautiously. AI exposure itself does not necessarily enhance creativity. Without sufficient AI literacy, students may over-rely on AI-generated outputs or fail to evaluate their originality, usefulness, and ethical acceptability. Therefore, the theoretical argument of this study is not that AI use automatically improves creativity, but that AI literacy may help students use AI critically, responsibly, and productively in ways that support innovation ability.

Based on the above reasoning, the following hypothesis is proposed:

H1. AI literacy is positively associated with creativity among university students.

2.2 The Mediating Role of Grit

2.2.1 Definition of Grit

Grit is a motivational trait that reflects sustained effort and long-term commitment. Duckworth et al. [8] defined grit as perseverance and passion for long-term goals, emphasizing that gritty individuals maintain effort and interest despite challenges, setbacks, and slow progress. This definition distinguishes grit from short-term effort because it focuses on enduring commitment over time. Duckworth and Quinn [9] further developed the Short Grit Scale and conceptualized grit through two related dimensions: perseverance of effort and consistency of interests. In educational contexts, grit reflects students' tendency to continue working toward academic goals, remain engaged in challenging tasks, and persist despite difficulties. This construct is particularly relevant to creativity because creative work often requires repeated attempts, revision, tolerance of failure, and long-term engagement. In this study, grit refers to university students' persistent effort and commitment when facing academic and AI-supported learning challenges.

2.2.2 AI Literacy, Grit, and Creativity

AI literacy may be positively associated with grit, although direct empirical evidence on the AI literacy–grit relationship remains limited. Existing studies have more frequently linked AI literacy to AI self-efficacy, AI-supported output quality, and academic outcomes. For example, Bećirović et al. [6] found that university students' AI technical understanding and practical AI application significantly predicted AI self-efficacy. This finding is theoretically relevant because self-efficacy theory suggests that perceived competence can support persistence and sustained effort when individuals face difficult tasks [18]. In AI-supported learning contexts, students with higher AI literacy may feel more capable of understanding AI, using AI tools appropriately, and handling AI-related uncertainty. Such competence may make them more willing to persist in complex learning tasks and continue problem solving despite difficulties. Therefore, although this pathway still requires further empirical verification, it is reasonable to expect AI literacy to be positively associated with grit.

Grit may further contribute to creativity. Creativity is not only the result of sudden inspiration; it

also requires sustained exploration, repeated revision, and the ability to continue improving ideas despite failure. Sun [10] reported that grit significantly predicted creativity among Chinese EFL teachers, suggesting that sustained effort may be relevant to creative performance in educational contexts. Sun et al. [11] examined Chinese third-language students and found that perseverance of effort was positively related to creativity and directly predicted creativity. In addition, Seo and Lee [12] found that grit significantly influenced creativity and strengthened the positive relationship between critical thinking and creativity among university students. These studies suggest that grit may help learners transform cognitive resources, higher-order thinking, and sustained effort into creative outcomes.

Taken together, AI literacy may provide students with competence and confidence in AI-supported learning, while grit may help them maintain effort and convert learning opportunities into creative performance. Because of these relationships, grit can be expected to play a mediating role between AI literacy and creativity. Based on this reasoning, the following hypotheses are proposed:

H2. AI literacy is positively associated with grit among university students.

H3. Grit is positively associated with creativity among university students.

H4. Grit mediates the relationship between AI literacy and creativity.

2.3 The Moderating Role of AI Anxiety

2.3.1 Definition of AI Anxiety

AI anxiety refers to negative emotional responses associated with the use, evaluation, or consequences of artificial intelligence. Wang and Wang [13] developed the Artificial Intelligence Anxiety Scale and treated AI anxiety as a psychological construct related to AI learning, job replacement, sociotechnical uncertainty, and AI configuration concerns. Their work suggests that AI anxiety may influence students' motivated learning behavior rather than simply reflect a general dislike of technology.

Helali et al. [14] further proposed the concept of ethical AI dilemma anxiety in higher education. They defined it as psychological distress experienced by university students when facing moral uncertainty surrounding AI use in academic contexts. This definition is especially relevant to the present study because students may worry about academic integrity, unfair advantage, privacy, future competence, and broader social consequences of AI. In this study, AI anxiety refers to students' anxiety and psychological discomfort related to AI use and AI-related ethical uncertainty in academic learning.

2.3.2 AI Anxiety and the Mediating Process

AI anxiety may influence the mediating process linking AI literacy, grit, and creativity. Although AI literacy can provide students with knowledge and competence for AI-supported learning, high AI anxiety may reduce students' willingness to use these resources confidently. Wang and Wang [13] showed that AI anxiety is related to motivated learning behavior, indicating that it may shape how students respond to AI-supported learning tasks. In academic contexts, ethical AI dilemma anxiety may

also increase uncertainty about whether AI use is acceptable, fair, or academically responsible [14]. Therefore, AI anxiety may not necessarily block the relationship between AI literacy and grit, but it may weaken the later stage of the mediating process by limiting the extent to which grit can be transformed into creativity.

2.3.3 AI Anxiety and Creativity

AI anxiety may have a complex relationship with creativity. On the one hand, some level of concern about AI may reflect students' awareness of ethical risks and responsible use. On the other hand, excessive AI anxiety may interfere with creative engagement. Creativity requires openness, cognitive flexibility, exploration of uncertainty, and willingness to test new ideas. When students are highly anxious about academic integrity, privacy, dependence on AI, or future competence, their cognitive and emotional resources may be occupied by worry rather than exploration. Therefore, high AI anxiety may create an emotional condition that makes it more difficult for students to express innovation ability in AI-supported learning contexts.

2.3.4 AI Anxiety as a Moderator of the Grit-Creativity Relationship

The relationship between grit and creativity may vary according to students' level of AI anxiety. When AI anxiety is low, students with higher grit may be more willing to persist in AI-supported exploration, revise ideas, and transform sustained effort into creative outcomes. When AI anxiety is high, however, persistent effort may not be sufficient. Students may continue to work hard, but anxiety about AI use, academic integrity, or future uncertainty may reduce confidence, psychological safety, and creative risk-taking. Therefore, AI anxiety is expected to weaken the positive relationship between grit and creativity. However, direct empirical evidence on whether AI anxiety moderates the grit-creativity relationship remains limited, which makes this moderating hypothesis exploratory but theoretically meaningful in the current AI education context.

This moderation also implies a moderated mediation process. If grit mediates the relationship between AI literacy and creativity, and if AI anxiety weakens the effect of grit on creativity, then the indirect effect of AI literacy on creativity through grit should be weaker when AI anxiety is high. Based on this reasoning, the following hypotheses are proposed:

H5. AI anxiety moderates the relationship between grit and creativity, such that the positive relationship is weaker when AI anxiety is high.

H6. AI anxiety moderates the indirect effect of AI literacy on creativity through grit, such that the indirect effect is weaker when AI anxiety is high.

3. Research Methods

3.1 Research Design

This study adopted a cross-sectional quantitative research design to examine the relationship

between AI literacy and creativity among Chinese university students. Specifically, the study tested a moderated mediation model in which AI literacy was specified as the independent variable, creativity as the dependent variable, grit as the mediating variable, and AI anxiety as the moderating variable. The model assumed that AI literacy would predict creativity both directly and indirectly through grit, and that AI anxiety would moderate the relationship between grit and creativity. Gender, age, grade, and family economic status were included as control variables.

The measurement instruments used in this study were adapted from established scales. AI literacy was measured based on the AI Literacy Questionnaire developed by Ng et al. [3]. Grit was measured using the Short Grit Scale developed by Duckworth and Quinn [9]. AI anxiety was measured using the Ethical AI Dilemma Anxiety Scale developed by Helali et al. [14]. Creativity was measured using the creativity scale developed by Zhou and George [19].

3.2 Participants and Data Collection

The participants were Chinese university students. Data were collected in May 2026 through Wenjuanxing, a widely used online questionnaire platform in China. The questionnaire link was distributed online, and participation was voluntary and anonymous. Before completing the questionnaire, participants were informed of the purpose of the study and were assured that their responses would be used only for academic research. The study protocol received institutional review board approval before data collection.

Frequency analysis was conducted to describe participants' demographic and background characteristics, including gender, age, grade, major, city of residence, family economic status, and AI tool use frequency. Among the 2,464 valid participants, 1,482 were female (60.1%) and 982 were male (39.9%). In terms of age, 255 participants were 18 years old (10.3%), 996 were 19 years old (40.4%), 615 were 20 years old (25.0%), 339 were 21 years old (13.8%), 177 were 22 years old (7.2%), and 82 were more than 22 years old (3.3%). Regarding grade level, 1,236 were first-year students (50.2%), 706 were second-year students (28.7%), 316 were third-year students (12.8%), and 206 were fourth-year students (8.4%). Participants' major fields included arts and design, engineering and information technology, economics and management, humanities and social sciences, medicine and health sciences, education and psychology, science, and other fields. Participants came from different cities and provinces. Family economic status was mainly moderate (n = 1,682, 68.3%), followed by low (n = 560, 22.7%), very low (n = 118, 4.8%), high (n = 81, 3.3%), and very high (n = 23, 0.9%). Most participants had experience using AI tools. Among these variables, gender, age, grade, and family economic status were included as covariates in the moderated mediation analysis.

3.3 Measures and Measurement Validation

All main variables were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated higher levels of the corresponding construct.

AI literacy was measured using items adapted from the AI Literacy Questionnaire developed by Ng et al. [3]. After exploratory factor analysis, 28 items were retained for the final measurement model.

The final EFA results indicated a Kaiser-Meyer-Olkin (KMO) value of .982, and Bartlett's test of sphericity was significant, χ^2 (378) = 88,709.817, $p < .001$. Three factors were extracted, explaining 76.822% of the total variance. Because the retained AI literacy structure included three factors, a first-order three-factor CFA model allowing correlations among the factors was specified. The CFA results showed acceptable model fit, χ^2 /df = 9.265, GFI = .913, AGFI = .891, CFI = .970, TLI = .965, and RMSEA = .058. The internal consistency coefficients of the retained AI literacy factors were .960, .979, and .949.

Grit was measured using the Short Grit Scale developed by Duckworth and Quinn [9]. The scale consists of eight items and captures two components of grit: perseverance of effort and consistency of interests. The EFA results indicated a KMO value of .888, and Bartlett's test of sphericity was significant, χ^2 (28) = 18,489.311, $p < .001$. Two factors were extracted, explaining 79.198% of the total variance. Because the retained grit structure included two factors, a first-order two-factor CFA model allowing the two factors to correlate was specified. The CFA results showed good model fit, χ^2 /df = 8.399, GFI = .987, AGFI = .970, CFI = .994, TLI = .989, and RMSEA = .055. The two subscales showed good internal consistency, with Cronbach's α values of .944 and .930.

AI anxiety was measured using items adapted from the Ethical AI Dilemma Anxiety Scale developed by Helali et al. [14]. After exploratory factor analysis, 19 items were retained for the final measurement model. The final EFA results indicated a KMO value of .978, and Bartlett's test of sphericity was significant, χ^2 (171) = 53,070.822, $p < .001$. Two factors were extracted, explaining 74.451% of the total variance. Because the retained AI anxiety structure included two factors, a first-order two-factor CFA model allowing the two factors to correlate was specified. The CFA results indicated acceptable model fit, χ^2 /df = 15.285, GFI = .907, AGFI = .877, CFI = .961, TLI = .954, and RMSEA = .076. The two retained factors showed high internal consistency, with Cronbach's α values of .946 and .973.

Creativity was measured using the 13-item scale developed by Zhou and George [19]. The EFA results indicated a KMO value of .980, and Bartlett's test of sphericity was significant, χ^2 (78) = 43,605.758, $p < .001$. One factor was extracted, explaining 79.961% of the total variance. A first-order one-factor CFA model was specified. The CFA results showed good model fit, χ^2 /df = 11.277, GFI = .964, AGFI = .939, CFI = .987, TLI = .982, and RMSEA = .065. The scale showed excellent internal consistency in the present study, with Cronbach's α = .981.

3.4 Common Method Bias

Because all main variables were collected using self-report questionnaires, common method bias was assessed using multiple diagnostics rather than relying only on Harman's single-factor test [20]. First, a full collinearity assessment was conducted following the full collinearity approach [21]. The full VIF values were 2.428 for AI literacy, 1.143 for grit, 1.815 for AI anxiety, and 2.960 for creativity; all values were below the commonly used threshold of 3.3, suggesting that common method bias was unlikely to be a serious concern. Second, a CFA-based common latent factor (CLF) approach was used. The baseline measurement model showed χ^2 /df = 18.648, CFI = .819, TLI = .813, and RMSEA = .085. After adding the common latent factor, the model showed χ^2 /df = 17.220, CFI = .838, TLI = .828, and RMSEA = .081. The changes in fit were limited (ΔCFI = .019, ΔTLI = .015, ΔRMSEA = .004),

indicating that adding a common latent factor did not substantially alter the model. Together with the measurement validation results reported above, these diagnostics suggest that common method bias was not likely to seriously distort the observed relationships.

3.5 Data Analysis

SPSS, AMOS, and the PROCESS macro were used for statistical analysis. First, descriptive statistics and Pearson correlation analyses were conducted to examine the distribution and bivariate relationships among the main variables. Second, exploratory factor analysis and confirmatory factor analysis were conducted to examine construct validity. Third, common method bias was assessed using a common latent factor approach. Finally, the hypothesized moderated mediation model was tested using PROCESS macro Model 14. AI literacy was entered as the independent variable, creativity as the dependent variable, grit as the mediator, and AI anxiety as the moderator. Gender, age, grade, and family economic status were controlled. The mediation and moderated mediation effects were tested using 5,000 bootstrap samples and 95% confidence intervals. An indirect effect was considered significant when the bootstrap confidence interval did not include zero. The index of moderated mediation was used to determine whether AI anxiety significantly moderated the indirect effect of AI literacy on creativity through grit. HC3 robust standard errors were used to reduce potential bias caused by heteroscedasticity.

4. Research Results

4.1 Correlations Between Main Variables

Descriptive statistics and Pearson correlation analyses were conducted to examine the bivariate relationships among the main variables, including AI literacy, grit, AI anxiety, and creativity. As shown in Table 1, AI literacy was positively correlated with grit ($r = .158$, $p < .01$), AI anxiety ($r = .533$, $p < .01$), and creativity ($r = .762$, $p < .01$). Grit was negatively correlated with AI anxiety ($r = -.113$, $p < .01$) and positively correlated with creativity ($r = .189$, $p < .01$). AI anxiety was also positively correlated with creativity ($r = .620$, $p < .01$). These results indicate that the main variables were significantly associated with one another, providing preliminary support for further moderated mediation analysis.

Table 1. Descriptive Statistics and Correlations Among Main Variables

Variable	M	SD	Skewness	Kurtosis	1	2	3	4
1. AI literacy	4.132	0.694	-0.876	2.268	1			
2. Grit	3.148	0.419	1.558	4.320	.158**	1		
3. AI anxiety	3.867	0.769	-0.483	0.843	.533**	-.113**	1	
4. Creativity	3.981	0.762	-0.412	0.353	.762**	.189**	.620**	1

Note. N = 2,464. ** $p < .01$.

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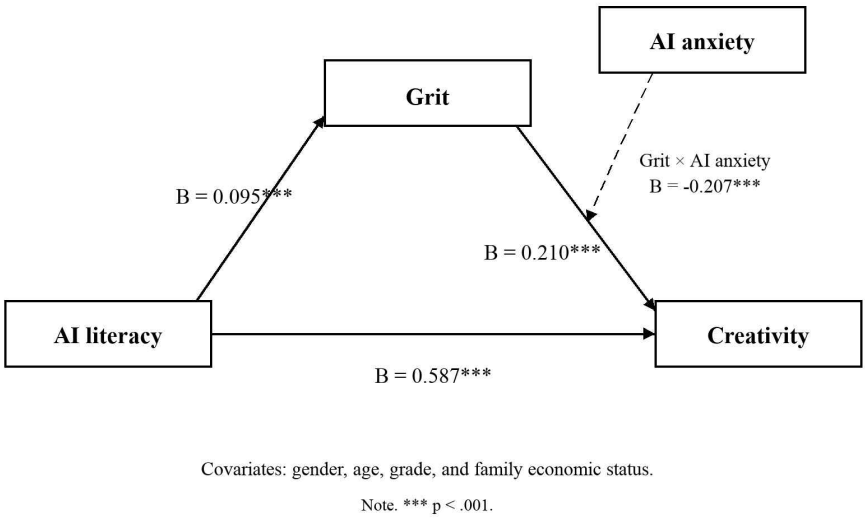
4.2 Moderated Mediation Effect

To test the proposed moderated mediation model, PROCESS macro Model 14 was used with 5,000 bootstrap samples and 95% confidence intervals. Gender, age, grade, and family economic status were included as covariates. The proposed moderated mediation model is presented in Figure 1.



Note. Unstandardized coefficients are reported.

Figure 1. Statistical Model of the Moderated Mediation Effect

In the first regression equation, AI literacy significantly and positively predicted grit (B = 0.095, SE = 0.011, t = 8.626, p < .001, 95% CI [0.073, 0.117]). The model explained 3.3% of the variance in grit (R^2 = .033, F = 17.638, p < .001).

Although this path was statistically significant, the explained variance in grit was modest (R^2 = .033), suggesting that grit is also shaped by other personal and contextual factors beyond AI literacy.

In the second regression equation, AI literacy significantly and positively predicted creativity (B = 0.587, SE = 0.038, t = 15.362, p < .001, 95% CI [0.512, 0.662]). Grit also had a significant positive effect on creativity (B = 0.210, SE = 0.027, t = 7.709, p < .001, 95% CI [0.157, 0.263]). The overall model explained 67.0% of the variance in creativity (R^2 = .670, F = 643.943, p < .001).

The interaction between grit and AI anxiety was significant and negative (B = -0.207, SE = 0.032, t = -6.528, p < .001, 95% CI [-0.269, -0.145]). The interaction term accounted for an additional 0.9% of the variance in creativity (ΔR^2 = .009, F = 42.611, p < .001). This finding indicates that AI anxiety significantly moderated the relationship between grit and creativity.

Simple slope analyses further showed that the positive effect of grit on creativity was strongest when AI anxiety was low (-1 SD: B = 0.369, SE = 0.038, t = 9.715, p < .001, 95% CI [0.295, 0.444]). The effect remained significant at the mean level of AI anxiety (B = 0.210, SE = 0.027, t = 7.709, p < .001, 95% CI [0.157, 0.263]). However, when AI anxiety was high (+1 SD), the effect of grit on

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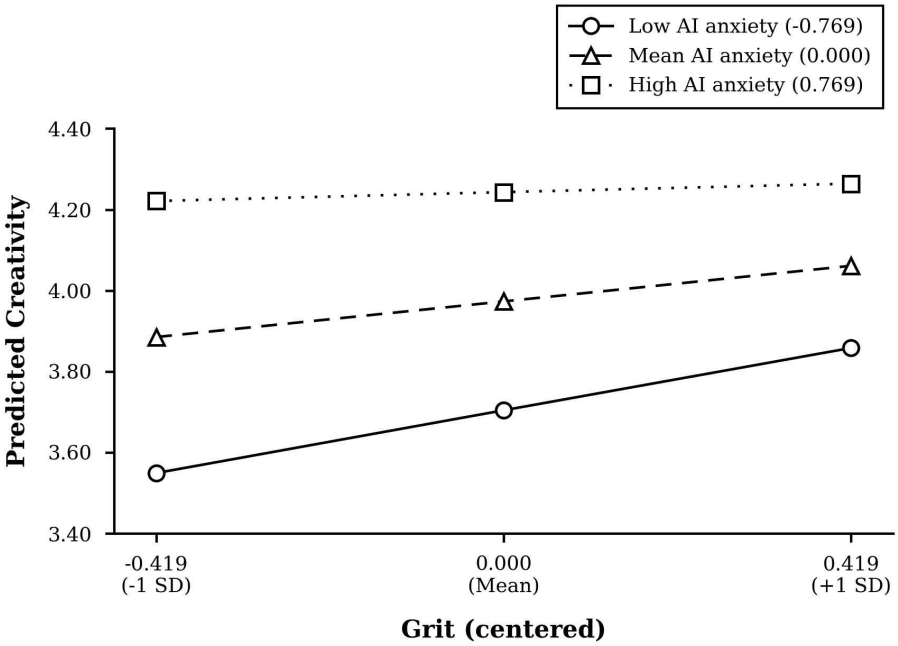
creativity became non-significant (B = 0.051, SE = 0.035, t = 1.456, p = .146, 95% CI [-0.018, 0.120]). The interaction pattern is illustrated in Figure 2. The plotted values were based on the mean-centered values used in PROCESS.



Note. Values are model-based predicted creativity scores from PROCESS macro Model 14. Grit and AI anxiety values are shown as mean-centered values; the corresponding original-scale values are 2.729, 3.148, and 3.567 for grit and 3.098, 3.867, and 4.636 for AI anxiety.

Figure 2. Moderating Effect of AI Anxiety on the Relationship Between Grit and Creativity

The conditional indirect effects were then examined. The indirect effect of AI literacy on creativity through grit was significant when AI anxiety was low (Effect = 0.035, BootSE = 0.006, 95% BootCI [0.025, 0.047]) and at the mean level of AI anxiety (Effect = 0.020, BootSE = 0.004, 95% BootCI [0.013, 0.028]). However, the indirect effect was not significant when AI anxiety was high (Effect = 0.005, BootSE = 0.003, 95% BootCI [-0.002, 0.012]).

Finally, the index of moderated mediation was significant (Index = -0.020, BootSE = 0.004, 95% BootCI [-0.027, -0.013]). Since the bootstrap confidence interval did not include zero, the moderated mediation effect was supported. Specifically, AI anxiety weakened the indirect effect of AI literacy on creativity through grit.

Table 2. Regression Results for the Moderated Mediation Model

Outcome	Predictor	B	SE	t	p	95% CI
Grit	AI literacy	0.095	0.011	8.626	< .001	[0.073, 0.117]
Creativity	AI literacy	0.587	0.038	15.362	< .001	[0.512, 0.662]
Creativity	Grit	0.210	0.027	7.709	< .001	[0.157, 0.263]
Creativity	AI anxiety	0.351	0.030	11.508	< .001	[0.291, 0.410]
Creativity	Grit × AI anxiety	-0.207	0.032	-6.528	< .001	[-0.269, -0.145]

Note. N = 2,464. Gender, age, grade, and family economic status were controlled. HC3 robust standard

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errors were used. Unstandardized coefficients are reported.

Table 3. Conditional Effects of Grit on Creativity at Different Levels of AI Anxiety

AI anxiety	Effect	SE	t	p	95% CI
Low (-1 SD)	0.369	0.038	9.715	< .001	[0.295, 0.444]
Mean	0.210	0.027	7.709	< .001	[0.157, 0.263]
High (+1 SD)	0.051	0.035	1.456	.146	[-0.018, 0.120]

Table 4. Conditional Indirect Effects of AI Literacy on Creativity Through Grit at Different Levels of AI Anxiety

AI anxiety	Effect	BootSE	95% BootCI
Low (-1 SD)	0.035	0.006	[0.025, 0.047]
Mean	0.020	0.004	[0.013, 0.028]
High (+1 SD)	0.005	0.003	[-0.002, 0.012]

Note. Bootstrap sample size = 5,000.

Table 5. Index of Moderated Mediation

Moderator	Index	BootSE	95% BootCI
AI anxiety	-0.020	0.004	[-0.027, -0.013]

Note. The moderated mediation effect is significant when the bootstrap confidence interval does not include zero.

5. Discussion and Conclusion

5.1 Discussion of Main Findings

This study examined whether AI literacy is associated with university students' creativity and whether this relationship operates through grit under different levels of AI anxiety. Overall, the findings supported the proposed moderated mediation model. AI literacy positively predicted creativity and grit, grit positively predicted creativity, and AI anxiety weakened the positive relationship between grit and creativity. The conditional indirect effect further showed that the indirect effect of AI literacy on creativity through grit was significant when AI anxiety was low or average, but not when AI anxiety was high.

First, the positive relationship between AI literacy and creativity supports the view that AI literacy is a multidimensional competence involving knowledge, application, evaluation, and ethical awareness [1-3]. AI-literate students may be better able to use AI for information exploration, idea generation, evaluation, revision, and knowledge integration. This interpretation is consistent with creativity theories emphasizing knowledge resources, motivation, and supportive environments [4,5]. This finding is broadly consistent with recent studies linking AI literacy to AI-supported learning outcomes and creativity-related beliefs [6,7].

Second, AI literacy positively predicted grit. This finding should be interpreted cautiously because direct empirical evidence linking AI literacy to grit remains limited. Existing work has more often

linked AI literacy to AI self-efficacy and AI-supported output quality [6]. Drawing on self-efficacy theory, students who feel more competent in AI-supported learning may be more willing to persist when facing complex tasks. The present findings therefore suggest that AI literacy may be associated not only with cognitive and technical readiness but also with motivational persistence. At the same time, the relatively low R^2 for grit indicates that this association should be interpreted as a modest link rather than a comprehensive explanation of students' persistence; factors such as personality, learning experience, goal orientation, and institutional support may also influence grit.

Third, grit positively predicted creativity. This result is consistent with the meaning of grit as sustained effort toward long-term goals [8,9]. Creativity in academic contexts often requires repeated exploration, failure tolerance, and revision. Prior studies have also shown that grit or perseverance of effort is related to creativity in educational settings [10-12]. Thus, the present result is consistent with prior findings that perseverance of effort and grit are associated with creativity-related outcomes in educational settings [10-12].

Fourth, AI anxiety weakened the grit-creativity relationship. The simple slopes showed that the effect of grit was strongest under low AI anxiety, weaker at the mean level, and non-significant under high AI anxiety. This pattern suggests that persistence may be less likely to translate into creativity when students experience strong anxiety about AI use, academic integrity, privacy, dependence, or future competence. Importantly, Figure 2 shows that high AI anxiety is associated with a higher predicted creativity level because the main effect of AI anxiety was positive, but the slope of grit becomes flatter because the interaction term was negative. The positive main effect of AI anxiety should therefore be interpreted cautiously. In this sample, higher AI anxiety may partly reflect greater awareness of AI-related ethical risks, academic integrity issues, and future competence demands [13,14], rather than only avoidance of AI. Nevertheless, the negative interaction indicates that when anxiety becomes high, persistence is less likely to be translated into creativity.

5.2 Theoretical Implications

This study offers three main theoretical implications. First, it extends AI literacy research by linking AI literacy to creativity among Chinese university students. Second, it identifies grit as a possible motivational mechanism through which AI literacy is associated with creativity. This contribution is modest but meaningful because the AI literacy-grit pathway has received limited empirical attention. Third, it identifies AI anxiety as an emotional boundary condition that weakens the conversion of grit into creativity and attenuates the indirect effect of AI literacy on creativity through grit. These findings suggest that creativity development in AI-supported higher education depends not only on AI-related competence but also on motivational and emotional conditions.

5.3 Practical and Policy Implications

The findings suggest that universities should treat AI literacy as a general competence for all students. AI literacy education should include basic AI concepts, responsible use, evaluation of AI-generated content, data privacy, algorithmic bias, academic integrity, and ethical decision making. AI tools should also be integrated into creativity-oriented pedagogies such as project-based learning,

inquiry-based learning, interdisciplinary problem solving, and reflective revision tasks.

Universities should also support grit and reduce excessive AI anxiety. Because grit partly explained the relationship between AI literacy and creativity, learning tasks should encourage persistence, iterative revision, and reflection. At the same time, clear institutional guidelines, acceptable-use examples, privacy guidance, and low-pressure practice opportunities may reduce unnecessary uncertainty and help students use AI more confidently and creatively. More specifically, universities may develop short AI literacy modules, transparent AI ethical-use guidelines, project-based AI-supported creativity tasks, iterative revision activities, and low-pressure practice sessions that allow students to use AI responsibly while reducing unnecessary uncertainty.

These implications are consistent with broader policy priorities. UNESCO [15] emphasizes preparing students as responsible AI users and co-creators, while China's Education Powerhouse Construction Plan Outline (2024-2035) [16] and the "AI + Education" Action Plan [17] emphasize digital transformation, intelligent literacy, innovative thinking, complex problem solving, and the cultivation of top innovative talent. The present study provides micro-level evidence that AI literacy may support innovation ability, but that this process also depends on persistence and manageable AI anxiety.

5.4 Limitations and Future Research

Several limitations should be noted. First, the cross-sectional design does not allow firm causal conclusions; future research could use longitudinal, experimental, or intervention designs. Second, although common method bias was assessed using full VIF and CFA-based CLF approaches, the self-report design may still involve subjective perception or response bias; future studies could combine self-report data with teacher ratings, peer evaluations, learning analytics, or performance-based creativity tasks. Third, the online survey and regional distribution of the sample may limit representativeness, even though the sample size was large; future studies should use more balanced sampling across regions, universities, and disciplines. Fourth, future studies could examine additional mechanisms and boundary conditions, such as critical thinking, growth mindset, AI self-efficacy, learning engagement, and different dimensions of AI anxiety.

5.5 Conclusion

This study tested a moderated mediation model linking AI literacy, grit, AI anxiety, and creativity among Chinese university students. The findings showed that AI literacy was positively associated with creativity directly and indirectly through grit, while AI anxiety weakened both the grit-creativity relationship and the indirect effect through grit. The study provides correlational evidence that AI literacy may support university students' innovation ability, but this relationship is shaped by motivational persistence and emotional responses to AI. These findings highlight the need for higher education to integrate AI literacy education, grit-supportive learning design, and AI anxiety management in the AI era.

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1. Appendix A

Summary of Measurement Instruments

Construct	Source	Original items	Retained items	Measurement focus	Scale format	Reliability in this study
AI literacy	Ng et al. (2024)	32	28	Students' affective, behavioural, cognitive, and ethical readiness to understand, use, evaluate, and engage responsibly with AI	5-point Likert scale	Cronbach's alpha = .960, .979, and .949 for the retained factors
Grit	Duckworth and Quinn (2009)	8	8	Perseverance of effort and consistency of interests in academic and learning-related tasks	5-point Likert scale	Cronbach's alpha = .944 and .930 for the two subscales
AI anxiety	Helali et al. (2026)	24	19	Anxiety and psychological discomfort related to ethical uncertainty, perceived risks, and consequences of AI use in academic contexts	5-point Likert scale	Cronbach's alpha = .946 and .973 for the retained factors
Creativity	Zhou and George (2001)	13	13	Students' perceived ability to generate novel and useful ideas, approaches, and solutions in academic learning contexts	5-point Likert scale	Cronbach's alpha = .981

Note. All items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated higher levels of the corresponding construct. AI literacy and AI anxiety items were retained based on exploratory factor analysis. The full list of retained measurement items can be made available upon reasonable request.

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The Mediating Role of Workplace Incivility in the Relationship Between Work Engagement and Work Satisfaction among Chinese Employees: The Moderated Mediating Effect of Exhaustion

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중국 근로자의 직무몰입과 직무만족의 관계에서 직장 내 무례경험의 매개역할: 소진의 조절된 매개효과

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Abstract: This study examined whether exhaustion moderates the mediating role of workplace incivility in the relationship between work engagement and work satisfaction. Using survey data from 621 Chinese employees, a moderated mediation model was tested with Model 7 of the SPSS PROCESS macro. Results indicated that work engagement was positively associated with work satisfaction and negatively associated with exhaustion and workplace incivility. Exhaustion was positively related to workplace incivility and negatively related to work satisfaction. Furthermore, exhaustion significantly moderated the relationship between work engagement and workplace incivility, as well as the indirect effect of work engagement on work satisfaction through workplace incivility. Specifically, the conditional mediating effect of workplace incivility was significant only at low levels of exhaustion. When exhaustion was high, the indirect effect was no longer statistically significant.

Keywords: Work Engagement, Work satisfaction, Workplace Incivility, Exhaustion, Moderated Mediation Effect

초 록: 본 연구는 소진이 직무몰입과 직무만족 간의 관계에서 직장 내 무례경험의 조건부 매개효과를 조절하는지를 검증하고자 하였다. 이를 위해 중국 기업에 재직 중인 근로자 621명을 대상으로 수집한 설문자료를 활용하여 SPSS PROCESS Macro Model 7을 적용한 조절된 매개효과 분석을 실시하였다. 분석 결과, 직무몰입은 직무만족과 유의한 정적 관계를 나타낸 반면, 소진 및 직장 내 무례경험과는 유의한 부적 관계를 보였다. 또한 소진은 직장 내 무례경험과 유의한 정적 관계를 나타냈으며, 직무만족과는 유의한 부적 관계를 보였다. 아울러 소진은 직무몰입과 직장 내 무례경험 간의 관계를 유의하게 조절하는 것으로 나타났다. 더 나아가 직무몰입이 직장 내 무례경험을 통해 직무만족에 영향을 미치는 간접효과 역시 소진 수준에 따라 달라지는 것으로 확인되었다. 구체적으로, 직장 내 무례경험의 조건부 간접효과는 소진 수준이 낮을 때 유의하게 나타났으나, 소진 수준이 높을 때에는 통계적으로 유의하지 않은 것으로 나타났다. 이러한 결과는 소진이 직무몰입이 직무만족으로 이어지는 과정에서 직장 내 무례경험의 영향을 완충하거나 강화하는 중요한 맥락적 요인임을 시사한다.

주요어: 직무몰입, 직무만족, 무례경험, 소진, 조절된 매개효과

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1. Introduction

With the continuous increase in work intensity and competitive pressure in modern organizations, employees' psychological well-being and work attitudes have become central concerns in organizational management. Work engagement, defined as a positive, fulfilling work-related affective and cognitive state, has been widely demonstrated to enhance employees' work satisfaction and reduce their turnover intentions [1,2]. However, employees are influenced not only by their own motivational states but also by negative workplace factors such as workplace incivility and exhaustion. Workplace incivility is prevalent in organizations and has been found to exert a significant negative impact on employees' work engagement [3]. Although previous studies among Chinese employees have consistently demonstrated a positive relationship between work engagement and work satisfaction [1,2], little attention has been paid to the interpersonal mechanisms underlying this relationship, particularly the mediating role of workplace incivility. Moreover, despite the recognized influence of exhaustion on employees' attitudes and behaviors, its moderating role in the indirect effect of work engagement on work satisfaction through workplace incivility remains unclear. Therefore, this study investigates workplace incivility as a mediator and exhaustion as a moderator in the relationship between work engagement and work satisfaction among Chinese employees.

Therefore, this study aims to examine whether exhaustion moderates the mediating role of workplace incivility in the relationship between work engagement and work satisfaction among Chinese employees. To achieve this objective, the following research questions are proposed: First, what are the relationships among the main study variables? Second, does exhaustion moderate the mediating effect of workplace incivility in the relationship between work engagement and work satisfaction? This study seeks to provide empirical evidence for a more comprehensive understanding of the mechanisms underlying employees' work satisfaction and to offer practical implications for effective organizational interventions.

2. Theoretical Background

2.1 Relationship between Work Engagement and Work Satisfaction

Work engagement refers to a positive, fulfilling, work-related affective and cognitive state characterized by vigor, dedication, and absorption [4]. Work engagement has been widely recognized as an important factor that enhances employees' work satisfaction and organizational performance. In a study of university faculty members, Wei [5] found that the nature of the work itself is one of the core determinants of work satisfaction, and employees with higher levels of work engagement tend to experience greater achievement and meaning in their work. The study conceptualized work satisfaction as a multidimensional construct consisting of four dimensions: work income, leadership and management, work relationships, and the work itself, providing an important theoretical basis for the present study. Similarly, Fu [1], in a study of knowledge workers in high-tech enterprises, confirmed that work satisfaction plays a significant mediating role in the relationship between employee attitudes and behaviors. However, the positive effect of work engagement on work satisfaction may not occur

directly; rather, it may be mediated or moderated by other factors, such as workplace incivility and exhaustion.

2.2. Mediating Role of Incivility

Workplace incivility is defined as low-intensity deviant behavior with ambiguous intent to harm that violates the norms of mutual respect in the workplace [6]. In recent years, Liu and Dai [7] systematically reviewed the dimensions, antecedents, and consequences of workplace incivility. Guo [3] pointed out that such behaviors are relatively common in organizations and have a significant negative impact on employees' work engagement. Studies by Fu and Li [1,8] further demonstrated that workplace incivility can seriously undermine employees' psychological safety and work satisfaction and may even increase their intention to leave the organization. Recent international evidence has produced similar findings. Turek [9] demonstrated that workplace incivility significantly reduces employees' job-related attitudes and organizational outcomes. The study further suggested that workplace incivility may function as an important mechanism through which positive workplace experiences are translated into favorable employee outcomes. When employees experience or engage in uncivil behavior at work, the positive emotional bonds between employees, their colleagues, and the organization may be disrupted, thereby reducing work satisfaction. Therefore, this study proposes that workplace incivility may serve as a conditional mediating variable through which work engagement influences work satisfaction, with this mediating pathway being contingent upon the level of exhaustion. Employees with higher levels of work engagement may help maintain a positive interpersonal climate by reducing uncivil behaviors, thereby enhancing work satisfaction. In contrast, lower levels of work engagement or a work environment characterized by frequent workplace incivility may erode employees' work satisfaction.

2.3 Moderating Role of Exhaustion

Exhaustion, the core dimension of burnout, refers to a state of extreme depletion of an individual's emotional and physical resources [10]. Guo [3] pointed out that Emotional exhaustion is an important outcome of workplace incivility and can further influence employees' work engagement. Consistent with this view, Xiao et al. [11] found that uncivil interactions in the workplace significantly contribute to emotional exhaustion and reduced employee well-being. Their findings suggest that repeated exposure to workplace incivility continuously depletes employees' psychological resources, increasing the likelihood of emotional exhaustion. In a study of primary and secondary school teachers, Ye [12] found that work stress has a significant positive effect on exhaustion, while perceived organizational support can mitigate this relationship. Among corporate employees, studies by Fu and Li [1,8] similarly demonstrated that when employees experience high levels of exhaustion, their self-regulatory resources are substantially depleted. As a result, even employees with initially high levels of work engagement may find it difficult to maintain appropriate behavioral norms due to resource exhaustion and may become more likely to engage in or be involved in workplace incivility. Under such circumstances, the positive effects of work engagement may be weakened or even reversed. Recent international studies have also shown that emotional exhaustion weakens employees' capacity to sustain work engagement.

Kaplan et al. [13] reported that resource depletion caused by emotional exhaustion significantly diminishes the positive effects of work engagement on workplace attitudes and behaviors. Therefore, exhaustion may serve as an important boundary condition influencing the relationship between work engagement and workplace incivility. Therefore, exhaustion is likely to moderate the pathway from work engagement to workplace incivility.

2.4 Theoretical Framework

The relationships among work engagement, workplace incivility, exhaustion, and work satisfaction can be understood through Conservation of Resources (COR) Theory [14]. COR Theory suggests that individuals seek to acquire and protect valuable resources, and that resource availability promotes positive attitudes and behaviors, whereas resource depletion leads to negative outcomes. Supporting this perspective, workplace incivility has been found to drain psychological resources and contribute to emotional exhaustion and other adverse outcomes [15].

Work engagement represents a resource-rich psychological state characterized by vigor, dedication, and absorption. Employees with higher work engagement are less likely to engage in workplace incivility, thereby fostering a more positive work environment and greater work satisfaction. In contrast, exhaustion reflects resource depletion and may weaken the beneficial effects of work engagement on interpersonal behavior. Therefore, workplace incivility is expected to mediate the relationship between work engagement and work satisfaction, while exhaustion moderates the relationship between work engagement and workplace incivility.

3. Research Methods

3.1 Research Model

To examine whether work engagement influences work satisfaction through the mediating role of workplace incivility and whether exhaustion moderates this mediating process, this study adopted Model 7 of the PROCESS macro (Version 4.2) developed by Hayes [16] and constructed a moderated mediation model, as shown in Figure 1. In this model, exhaustion serves as the moderator affecting the relationship between work engagement and workplace incivility. Gender, age, educational level, and marital status were included as control variables to account for their potential influences on both the mediator and the outcome variable.

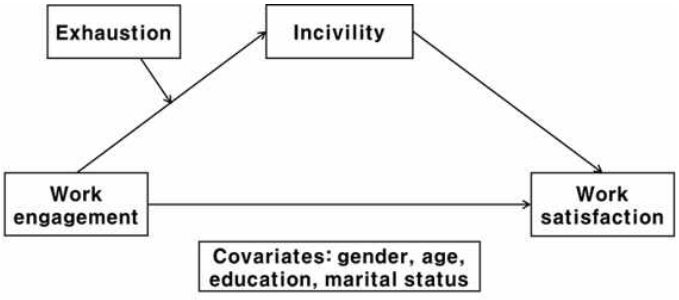

Figure 1. Research model

3.2 Hypothesis

Based on the literature review presented in the theoretical background, the following hypotheses were proposed:

H1: Work engagement has a significant positive effect on work satisfaction.

H2: Workplace incivility mediates the relationship between work engagement and work satisfaction.

H3: Exhaustion moderates the relationship between work engagement and workplace incivility.

H4: Exhaustion moderates the indirect effect of work engagement on work satisfaction through workplace incivility.

3.3 Participants and Data Collection

This study used convenience sampling to collect data from employees in various enterprises across multiple provinces and municipalities in China. The main sample came from Zhejiang, Chongqing, Shandong, Beijing, Hubei, and Yunnan. A total of 621 valid questionnaires were collected and used for the final analysis. Among the participants, 55.9% were female and 44.1% were male. Regarding age distribution, 28.7% were aged 25 years or younger, 36.4% were aged 26–35 years, 22.1% were aged 36–45 years, and 12.9% were aged 46 years or older. In terms of educational attainment, 14.7% had a high school education or below, 36.7% had an associate degree, 45.4% had a bachelor's degree, 3.1% had a master's degree, and 0.2% had a doctoral degree. With respect to marital status, 48.6% were unmarried and 51.4% were married. All participants voluntarily completed the questionnaire and provided informed consent prior to participation in the study.

3.4 Research Tools

3.4.1 Work Engagement

Work engagement was measured using the Utrecht Work Engagement Scale–Short Form (UWES-9) adopted in the study by Guo [3], which consists of nine items. The scale was originally developed by Schaufeli et al. [17]. It was subsequently introduced into China by Zhang and Gan [18], who examined the reliability and validity of the Chinese version. Guo [3] further confirmed its favorable psychometric properties among Chinese samples. Responses were assessed using a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating higher levels of work engagement. In the present study, the scale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.972.

3.4.2 Exhaustion

Exhaustion was measured using the Maslach Burnout Inventory–General Survey (MBI-GS) adopted in the study by Ye [10]. The instrument was originally developed by Maslach and Jackson [19]. Li [20]

confirmed that the Chinese version of the scale demonstrated good reliability and validity among Chinese samples (α = 0.88). Ye [10] further verified its favorable psychometric properties in a Chinese context. Responses were rated on a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating greater levels of exhaustion. In the present study, the scale showed excellent internal consistency, with a Cronbach's α coefficient of 0.961.

3.4.3 Incivility

Workplace incivility was measured using the Chinese version of the unidimensional Workplace Incivility Scale validated by Guo [3]. The scale was originally developed by Cortina et al. [21] and consists of 12 items. Previous research has demonstrated that the Chinese version possesses satisfactory reliability and validity among Chinese samples [3]. Responses were assessed on a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating a higher frequency of experiencing workplace incivility. In the present study, the scale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.984.

3.4.4 Work Satisfaction

Work satisfaction was measured using the Chinese version of the Minnesota Satisfaction Questionnaire (MSQ) employed in the study by Li [8]. The scale was originally developed by Weiss et al. [22] and consists of 20 items. Responses were rated on a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating greater work satisfaction. In the present study, the scale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.979.

3.4.5 General Characteristics and Control Variables

This study collected participants' demographic characteristics as control variables, including gender, age, educational level, and marital status.

3.5 Data analysis

The data were analyzed using SPSS version 25.0 and PROCESS Macro version 4.2. Frequency analyses were conducted to examine the basic characteristics of the sample, and reliability analyses were performed to assess the internal consistency of the measurement scales. Pearson correlation analyses were used to investigate the relationships among the main study variables. To test the moderated mediation effect of exhaustion, Model 7 of the SPSS PROCESS Macro was employed.

4. Research Results

4.1 Correlation among Variables

To examine the relationships among the study variables, Pearson product-moment correlation analysis was conducted. The results are presented in Table 1.

Work engagement was significantly and positively correlated with work satisfaction (r=.716, p < .01) and significantly and negatively correlated with exhaustion (r=－.363, p < .01) and workplace incivility (r=－.188, p<.01). Exhaustion was significantly and positively correlated with workplace incivility (r=.607, p<.01) and significantly and negatively correlated with work satisfaction (r=－.309, p<.01). Workplace incivility was significantly and negatively correlated with work satisfaction (r =－.223, p<.01). The correlation analysis indicated that the absolute values of all correlation coefficients were below .70, suggesting that multicollinearity was not a concern in the present study.

Descriptive statistics showed that the mean scores for work engagement (M=3.94, SD=0.99) and work satisfaction (M=3.93, SD=0.77) were slightly above the midpoint of the scale (3 on a 5-point scale). In contrast, the mean scores for exhaustion (M=2.86, SD=1.16) and workplace incivility (M= 2.16, SD=1.03) were below the midpoint of their respective scales. The absolute values of skewness and kurtosis for all variables were within acceptable ranges, indicating that the data generally satisfied the assumption of normality.

Table 1. Correlations among Study Variables and Descriptive Statistics

(N=621)

	1	2	3	4
1. Work engagement	1			
2. Exhaustion	-.363**	1		
3. Incivility	-.188**	.607**	1	
4. Work Satisfaction	.716**	-.309**	-.223**	1
M	3.9422	2.8573	2.1638	3.9277
SD	0.98708	1.15588	1.03034	0.77039
Skewness	-1.131	0.144	1.006	-0.708
Kurtosis	1.211	-0.796	0.67	1.207

Note. *p<.05, **p<.01, ***p<.001; M=Mean; SD=Standard Deviation.

4.2 Moderated Mediation Effect of Exhaustion

To examine the moderating role of exhaustion in the mediating pathway through which work engagement influences work satisfaction via workplace incivility, this study employed Model 7 of the PROCESS macro (Version 4.2) developed by Hayes. Gender, age, educational level, and marital status were included in the model as control variables. The detailed results of the analysis are presented in Table 2 and Figures 2 and 3.

4.2.1 Moderation Analysis

To examine the moderating effect of exhaustion, workplace incivility was specified as the dependent variable, work engagement as the independent variable, and exhaustion as the moderator. The interaction term between work engagement and exhaustion was also included in the regression model. As shown in Table 2, the interaction between work engagement and exhaustion significantly and positively predicted workplace incivility (B=.128, SE=.042, t=3.060, p=.002). The interaction term

accounted for a significant increase in explained variance (ΔR^2 =.025, F(1, 613)=9.366, p=.002), over and above the main effects of work engagement and exhaustion (full model R^2 =.429). This indicates that exhaustion significantly moderated the relationship between work engagement and workplace incivility.

To further clarify the nature of the moderating effect, conditional effects of work engagement on workplace incivility were examined at different levels of exhaustion. When exhaustion was at a low level (one standard deviation below the mean;－1.156), work engagement had a significant negative effect on workplace incivility (B=－.195, SE=.086, p=.024, 95% CI [－.363,－.026]). When exhaustion was at the mean level (.000), the effect of work engagement on workplace incivility was not significant (B=－.047, SE=.056,p=.405, 95% CI [－.156,.063]). When exhaustion was at a high level (one standard deviation above the mean; 1.156), the effect of work engagement on workplace incivility did not reach statistical significance (B=.102, SE=.059, p=.087, 95% CI [－.015, .218]).

The Johnson-Neyman significance region analysis further indicated that the moderating effect was significant when exhaustion was lower than －.768 (representing 32.2% of the sample) or higher than 1.329 (representing 12.2% of the sample). These findings suggest that as the level of exhaustion increases, the negative effect of work engagement on workplace incivility becomes weaker and may even show a tendency to reverse (see Figure 3).

4.2.2 Direct Effect and Conditional Indirect Effect Analysis

A regression analysis was conducted with work satisfaction as the dependent variable, work engagement as the independent variable, and workplace incivility as the mediator. As shown in Table 2, the direct effect of work engagement on work satisfaction was significant (B=.551, SE=.034, t= 16.019, $p < .001$, 95% CI [.484, .619]). In addition, the indirect effect of work engagement on incivility was not significant (B=-.047, SE=.056, t= -.834, $p > .05$, 95% CI [-.156, .063]). Therefore, H2 was not supported.

Workplace incivility had a significant negative effect on work satisfaction (B=－.069, SE=.028, t=－2.437, p=.015, 95% CI [－.124, －.013]).

The conditional indirect effects of work engagement on work satisfaction through workplace incivility (i.e., the moderated mediation effect) are presented in Table 3. When exhaustion was at a low level (－1.156), the indirect effect was .013 (BootSE=.008), with a 95% bootstrap confidence interval of [.002, .033], which did not include zero, indicating a significant indirect effect. When exhaustion was at the mean level (.000), the indirect effect was .003 (BootSE=.004), with a 95% bootstrap confidence interval of [－.003, .013], which included zero, indicating a non-significant effect. When exhaustion was at a high level (1.156), the indirect effect was －.007 (BootSE = .005), with a 95% bootstrap confidence interval of [－.017, .001], which also included zero, indicating a non-significant effect.

The index of moderated mediation was －.009 (BootSE=.004), and its 95% bootstrap confidence interval was [－.019, －.002], which did not include zero. This finding further confirmed the significance of the moderated mediation effect.

Overall, the results indicate that exhaustion moderates the indirect effect of work engagement on work satisfaction through workplace incivility. Specifically, when exhaustion is low, the indirect effect is significantly positive, suggesting that work engagement enhances work satisfaction by reducing

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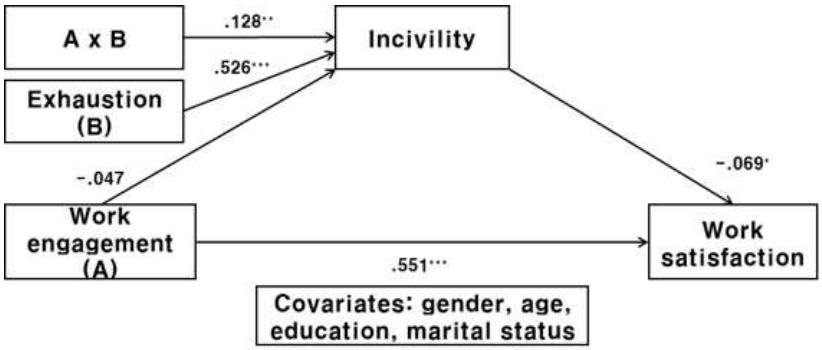
workplace incivility. However, as exhaustion increases, this indirect effect gradually weakens and eventually loses statistical significance.

Figure 3 visually illustrates the moderating effect of exhaustion. When exhaustion was at a low level, the slope representing the relationship between work engagement and workplace incivility was negative and relatively steep (B=－.195, p=.024). When exhaustion was at the mean level, the slope approached zero (B=－.047, p=.405). When exhaustion was at a high level, the slope became positive, although it did not reach statistical significance (B=.102, p=.087). These findings further confirm that exhaustion weakens the inhibitory effect of work engagement on workplace incivility.



[Figure 2] Statistical Model of Moderated Mediation Effect of Exhaustion

Table 2. Moderating Effect of Exhaustion

Category		DV: Incivility			DV: Work Satisfaction		
		B	SE	t value	B	SE	t value
Constant		1.729	.163	10.630***	4.161	.120	34.554***
IV		-.047	.056	-.834	.551	.034	16.019***
Mediator		-	-	-	-.069	.028	-2.437*
Moderator		.526	.044	11.846***	-	-	-
Interaction term		.128	.042	3.060**	-	-	-
Highest order test	R^2 change	.025					
	F	9.366**					
Covariates	Gender	.240	.064	3.733***	.037	.045	.812
	Age	.131	.044	2.972**	-.056	.035	-1.612
	Education Level	.045	.042	1.071	-.001	.031	-.020
	Marital status	-.023	.084	-.273	.044	.062	.706
Model summary	R^2		.429			.525	
	F		55.344***			49.292***	

Conditional effects of the focal predictor at values of the moderator

Exhaustion	B	SE	t value	LLCI	ULCI
-1.156 (-SD)	-.195	.086	-2.261*	-.363	-.026
.000 (SD)	-.047	.056	-.834	-.156	.063

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1.156 (+SD)	.102	.059	1.715	-.015	.218
Conditional effect of focal predictor at values of the moderator					
Value		% below		% above	
-.768		32.206		67.794	
1.329		87.762		12.238	
Exhaustion	B	SE	t value	LLCI	ULCI
-1.857	-.284	.111	-2.566*	-.502	-.067
			:		
-.805	-.150	.075	-1.998*	-.297	-.003
-.768	**-.145**	**.074**	**-1.964**	**-.290**	**.000**
-.594	-.123	.069	-1.782	-.258	.012
			:		
1.301	.120	.062	1.927	-.002	.242
1.329	**.124**	**.063**	**1.964**	**.000**	**.247**
1.511	.147	.068	2.176*	.014	.280
			:		
2.143	.228	.087	2.624**	.057	.398

Note. *p<.05, **p<.01, ***p<.001; LLCI=Lower Level Confidence Interval; ULCI=Upper Level Confidence Interval; B=Unstandardized coefficient.

To identify the regions in which the moderating effect of exhaustion on the relationship between work engagement and workplace incivility was statistically significant, the Johnson-Neyman technique was employed. The results indicated that the moderating effect was significant when the value of exhaustion was below −.768 (representing 32.2% of the sample) or above 1.329 (representing 12.2% of the sample). In contrast, when exhaustion ranged between −.768 and 1.329 (representing 55.6% of the sample), the moderating effect was not statistically significant.

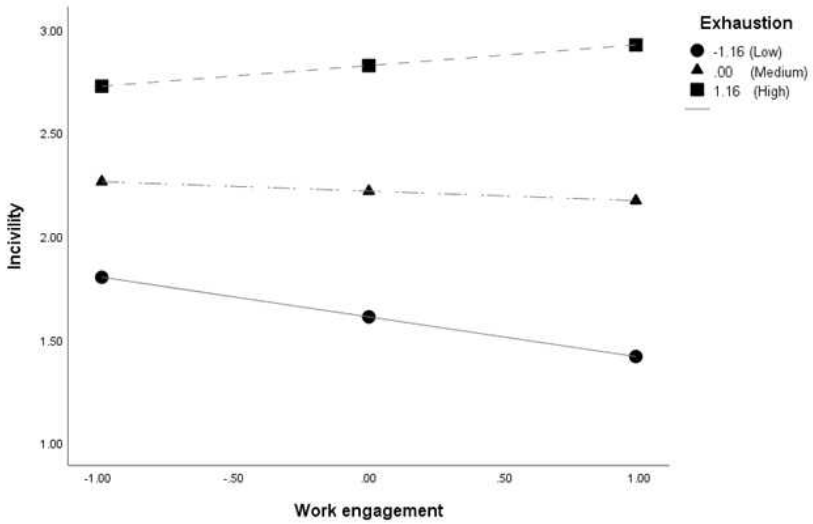

Figure 3. Moderating effect of exhaustion

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As shown in Figure 3, the negative relationship between work engagement and workplace incivility gradually weakened as exhaustion increased, demonstrating the resource-depleting role of exhaustion in this relationship.

In the mediating pathway through which work engagement influences work satisfaction via workplace incivility (Work Engagement → Workplace Incivility → Work satisfaction), the conditional indirect effect was significant when exhaustion was at a low level (M−1SD=−1.156; B=.013, BootSE=.008, 95% Bootstrap CI [.002, .033]). When exhaustion was at the mean level (M=.000), the indirect effect was B=.003 (BootSE=.004, 95% Bootstrap CI [−.003, .013]), which was not statistically significant. When exhaustion was at a high level (M+1SD=1.156), the indirect effect was B=−.007 (BootSE=.005, 95% Bootstrap CI [−.017, .001]), which was also not statistically significant.

The index of moderated mediation was −.009 (BootSE=.004, 95% Bootstrap CI [−.019, −.002]). Because the confidence interval did not include zero, the moderated mediation effect was confirmed to be statistically significant.

Table 3. Direct and conditional indirect effect

Direct effect of X on Y				
B	se	t value	LLCI	ULCI
.551	.034	16.019***	.484	.619
Conditional indirect effects of X on Y				
Exhaustion	B	BootSE	BootLLCI	BootULCI
-1.156 (Low)	.013	.008	.002	.033
.000 (Medium)	.003	.004	-.003	.013
1.156 (High)	-.007	.005	-.017	.001
Index of moderated mediation:				
	Index	BootSE	BootLLCI	BootULCI
Exhaustion	-.009	.004	-.019	-.002

Note. ***p<.001; LLCI=Lower Level Confidence Interval; ULCI=Upper Level Confidence Interval; B=Unstandardized coefficient.

4.3 Summary of Hypothesis Testing

The results of the hypothesis testing are summarized as follows:

H1 was supported: Work engagement significantly and positively predicted work satisfaction.

H2 was rejected: Workplace incivility mediates the relationship between work engagement and work satisfaction

H3 was supported: Exhaustion significantly moderated the relationship between work engagement and workplace incivility.

H4 was supported: Exhaustion moderates the indirect effect of work engagement on work satisfaction through workplace incivility.

5. Discussion and Conclusion

This study examined the mechanism through which work engagement influences work satisfaction, with a particular focus on the mediating role of workplace incivility and the moderating effect of exhaustion. Based on survey data collected from 621 Chinese employees, a moderated mediation analysis was conducted using PROCESS Model 7, yielding the following conclusions.

First, the positive relationship between work engagement and work satisfaction was confirmed. The analysis further revealed that the indirect effect of work engagement on work satisfaction through workplace incivility was conditional upon the level of exhaustion, being significant only when exhaustion was low (see Table 3). This suggests that higher work engagement may enhance work satisfaction by reducing incivility, but only among employees who are not depleted. However, the overall mediating effect of workplace incivility was not significant (H2 was not supported), indicating that the mediating pathway is not universally present but depends on the level of exhaustion.

Second, the moderated mediation effect of exhaustion corroborates the Conservation of Resources Theory [14]: exhaustion, as a resource-depleting state, attenuates the beneficial interpersonal effects of work engagement. When resources are depleted, even highly engaged employees may fail to inhibit incivility, thereby blocking the transmission of engagement into satisfaction. This underscores that the positive effects of work engagement are contingent upon employees' available personal resources.

The findings of this study provide several important practical implications for organizational management. First, the results highlight the positive role of work engagement in enhancing work satisfaction, suggesting that organizations should create conditions that encourage employees to invest themselves in their work. Providing meaningful job tasks, increasing employee autonomy, and fostering a supportive organizational climate may contribute to higher levels of work engagement and, consequently, greater work satisfaction. Second, the findings demonstrate that workplace incivility serves as a conditional mechanism linking work engagement to work satisfaction, particularly when employees are not experiencing high levels of exhaustion. Therefore, organizations should establish clear behavioral norms, strengthen interpersonal respect, and implement effective reporting and intervention systems to reduce workplace incivility. Third, the moderating role of exhaustion indicates that the beneficial effects of work engagement are contingent upon employees' resource conditions. When employees experience high levels of exhaustion, the positive influence of work engagement may be substantially weakened. Accordingly, organizations should pay close attention to employees' emotional well-being and implement resource-recovery strategies, such as reasonable workload management, adequate rest opportunities, and psychological support programs. For organizational policies and practices aimed at improving employee work satisfaction, an integrated approach that simultaneously promotes work engagement, reduces workplace incivility, and alleviates exhaustion is essential.

Finally, several limitations of this study should be acknowledged. First, this study employed a cross-sectional design, which limits the ability to establish causal relationships among work engagement, workplace incivility, exhaustion, and work satisfaction. Future studies should adopt longitudinal designs to verify the directionality and causality of these relationships more rigorously. Second, all variables were measured through employee self-reports, raising the possibility of common method bias. Future research may address this limitation by incorporating data from multiple sources, such as supervisor evaluations of work engagement and coworker assessments of workplace incivility. Third, the sample was limited to employees working in Chinese enterprises, which may restrict the generalizability of the

findings to other cultural and organizational contexts. In addition, cultural factors may influence employees' perceptions of work engagement, workplace incivility, exhaustion, and work satisfaction. Therefore, organizations operating in multicultural environments should consider potential cultural differences when applying the findings of this study, as employee responses to workplace incivility and exhaustion may vary across cultural contexts. Future studies are encouraged to examine the proposed model in different cultural settings to further assess its cross-cultural applicability and generalizability. Future studies should utilize more diverse samples across industries, regions, and countries to examine the robustness of the proposed model. Finally, future research may incorporate additional variables, such as organizational justice, leadership support, and psychological resilience, to provide a more comprehensive understanding of the mechanisms underlying employee work satisfaction.

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The Serial Dual Mediating Roles of Self-Efficacy and Perceived Social Support in the Relationship Between Academic Burnout and Academic Satisfaction among Chinese University Students

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중국 대학생의 학업소진이 학업만족도에 미치는 영향: 자기효능감과 지각된 사회적 지지의 연속적 이중매개효과

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Abstract: This study aimed to examine the underlying mechanism through which academic burnout influences academic satisfaction among university students. A serial dual mediation model was constructed with self-efficacy and perceived social support as mediating variables. Using a questionnaire survey method, data were collected from university students in China through the Academic Burnout Scale, the Self-Efficacy Scale, the Perceived Social Support Scale, and the Academic Satisfaction Scale. A total of 1,623 valid questionnaires were obtained. Statistical analyses were conducted using SPSS and the PROCESS macro. The results indicated that: First, academic burnout was negatively associated with academic satisfaction, whereas self-efficacy and perceived social support were positively associated with academic satisfaction. Furthermore, self-efficacy and perceived social support each significantly mediated the relationship between academic burnout and academic satisfaction (indirect effects: self-efficacy: -0.161, 95% CI [-0.190, -0.132]; perceived social support: -0.079, 95% CI [-0.105, -0.055]). Second, self-efficacy and perceived social support jointly formed a significant serial mediation pathway linking academic burnout to academic satisfaction (indirect effect = -0.131, 95% CI [-0.154, -0.109]). These findings reveal the underlying mechanism through which academic burnout affects academic satisfaction and provide theoretical evidence and practical implications for developing academic support programs and mental health interventions in higher education.

Keywords: Academic burnout; Academic satisfaction; Self-efficacy; Perceived social support; Serial mediation

초 록: 본 연구는 중국 대학생을 대상으로 학업소진과 학업만족도의 관계에서 자기효능감과 지각된 사회적 지지의 역할을 규명하고, 학업소진이 학업만족도에 영향을 미치는 심리적 메커니즘을 탐색하고자 하였다. 이를 위해 자기효능감과 지각된 사회적 지지를 매개변수로 설정한 연속적 이중매개모형(serial multiple mediation model)을 구축하였다. 연구 자료는 학업소진 척도, 일반 자기효능감 척도, 지각된 사회적 지지 척도, 학업만족도 척도를 활용하여 수집하였으며, 최종적으로 1,623명의 중국 대학생 자료를 분석에 활용하였다. 자료 분석은 SPSS와 PROCESS Macro를 이용하여 실시하였다. 연구 결과는 다음과 같다. 첫째, 연구 결과, 학업소진은 학업만족도와 부적 관계를 보였으며, 자기효능감과 지각된 사회적 지지는 학업만족도와 정적 관계를 나타냈다. 또한 자기효능감과 지각된 사회적 지지는 학업소진과 학업만족도의 관계를 각각 유의하게 매개하는 것으로 나타났다. 둘째, 자기효능감과 지각된 사회적 지지는 학업소진과 학업만족도의 관계에서 유의한 연속적 이중매개효과를 나타냈다. 이러한 결과는 학업소진이 학업만족도와 관련되는 과정에서 자기효능감과 지각된 사회적 지지가 중요한 심리적·사회적 자원으로 기능함을 시사한다. 또한 본 연구는 학업소진과 학업만족도의 관계를 설명하는 이론적 근거를 확장하였으며, 대학생의 학업적 적응과 정신건강 증진을 위한 학업지원 프로그램 및 상담 개입 방안을 마련하는 데 실천적 시사점을 제공한다.

핵심어: 학업소진, 학업만족도, 자기효능감, 지각된 사회적 지지, 연속적 이중매개효과

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1. Introduction

Academic satisfaction is an important indicator for evaluating university students' learning experiences and the quality of higher education. It reflects students' overall evaluation of their learning processes, learning environments, and academic outcomes[1]. Previous studies have shown that higher levels of academic satisfaction not only contribute to greater learning engagement and academic achievement[2], but also promote psychological well-being and positive personal development[3]. As higher education continues to expand and university students face increasing academic pressure, the factors influencing academic satisfaction have attracted growing attention from researchers.

In recent years, academic burnout has emerged as a significant issue affecting university students' academic adjustment and psychological development. Maslach et al. were among the first to conceptualize burnout, defining it as a syndrome characterized by emotional exhaustion, cynicism, and reduced personal accomplishment[4]. In educational settings, academic burnout is generally manifested through emotional exhaustion, maladaptive learning behaviors, and a diminished sense of academic achievement[5]. Existing studies have demonstrated that academic burnout not only reduces students' learning engagement but may also negatively affect their academic satisfaction and overall educational outcomes[6].

Social Cognitive Career Theory (SCCT) provides the overarching theoretical framework for this study, as it emphasizes the critical role of cognitive variables such as self-efficacy in shaping individuals' behavioral outcomes[7]. According to SCCT, self-efficacy influences how individuals respond to challenges and pursue their goals. Bandura[8] further emphasized that self-efficacy serves as a key psychological mechanism affecting behavioral choices, effort expenditure, and persistence in the face of challenges. Extending SCCT, Social Support Theory suggests that support from family members, peers, and teachers can buffer the adverse effects of stress and facilitate positive adaptation[9]. In addition, Conservation of Resources (COR) Theory complements this framework by positing that individuals are likely to experience burnout when their personal resources are continuously depleted, which subsequently reduces positive psychological experiences[10]. Integrating these theoretical perspectives within the SCCT framework, the present study proposes that self-efficacy (as an internal cognitive resource) and perceived social support (as an external environmental resource) may jointly mediate the relationship between academic burnout and academic satisfaction.

Recent international studies have further advanced our understanding of the mechanisms linking academic burnout to student outcomes. For instance, Xia et al.[11] found that among Chinese vocational education students, academic stress was positively correlated with burnout symptoms and significantly negatively correlated with school-life satisfaction, which partially mediated the stress-burnout relationship. These recent findings underscore the critical mediating roles of satisfaction-related constructs in the academic burnout process, highlighting the timeliness and relevance of the present study.

The Chinese higher education context presents unique characteristics that warrant specific attention. Unlike Western educational systems, Chinese university students operate within a highly competitive academic environment. The national college entrance examination (Gaokao) creates intense academic pressure from an early age, and this pressure often extends into university life. Furthermore, the

recent expansion of higher education has led to increasing competition in the job market, adding another layer of stress to students' academic experiences. Vocational college students, who constituted a substantial portion of our sample, face additional challenges. In Chinese society, undergraduate education is generally perceived as a more desirable educational pathway, whereas vocational education tends to have relatively lower social recognition. This perception may influence students' learning motivation and academic satisfaction. These unique institutional and environmental factors make China an important context for examining the mechanisms linking academic burnout to academic satisfaction.

However, previous studies have primarily examined the independent roles of self-efficacy or social support, while relatively little attention has been paid to their sequential mechanisms in the relationship between academic burnout and academic satisfaction. Unlike previous research, the present study makes a unique contribution by integrating these two mediators into a sequential dual mediation model within the specific context of Chinese higher education. Therefore, using Chinese university students as the research population, the present study investigates the dual mediating roles of self-efficacy and perceived social support in the relationship between academic burnout and academic satisfaction. By doing so, this study seeks to further clarify the underlying psychological mechanisms through which academic burnout influences academic satisfaction.

2. Theoretical Background

2.1 Relationship between Academic Burnout and Academic Satisfaction

Academic satisfaction refers to students' overall evaluation of their learning experiences, learning environment, and academic outcomes, and is considered an important indicator of learning adjustment and educational quality in higher education. Li and Wang argued that academic satisfaction not only reflects students' subjective perceptions of their learning experiences but is also closely associated with their psychological well-being and future development[12]. Furthermore, Ding and Ma found that higher levels of academic satisfaction contribute to the development of positive emotions and greater engagement in learning activities among university students[2].

The concept of academic burnout originated from Maslach's theory of occupational burnout, which is characterized by emotional exhaustion, cynicism, and a reduced sense of personal accomplishment. In the context of higher education, Lian et al. defined academic burnout as a psychological state characterized by emotional exhaustion, learning alienation, and diminished academic efficacy resulting from prolonged academic stress[5]. Fang et al. reported that students with higher levels of academic burnout are more likely to develop negative learning attitudes and withdrawal behaviors, thereby hindering their academic adjustment and development[13]. Furthermore, a longitudinal study conducted by Lindner et al. demonstrated that burnout-related behaviors, such as academic procrastination, not only reduce academic satisfaction but also significantly increase students' intentions to drop out of university[14].

According to Conservation of Resources Theory (COR Theory)[10], individuals are likely to experience burnout when their personal resources are continuously depleted without adequate replenishment, which subsequently reduces positive psychological experiences. For university students, prolonged

academic stress and resource depletion may lead to negative evaluations of the learning process, thereby reducing academic satisfaction. Empirical evidence supports this perspective. For example, Yang's survey of 704 university students revealed a significant negative relationship between academic burnout and academic major satisfaction[15].

Therefore, academic burnout is expected to negatively predict academic satisfaction among university students.

2.2 Mediating Role of Self-Efficacy

According to Bandura's Social Cognitive Theory[8,16], self-efficacy refers to an individual's belief in his or her capability to successfully perform specific tasks and achieve desired outcomes. It is a key psychological factor influencing behavioral choices, effort expenditure, and persistence when facing challenges[16].

In the educational context, self-efficacy has been widely used to explain students' learning behaviors and academic outcomes. Previous empirical studies have demonstrated that academic self-efficacy significantly influences university students' learning motivation, learning strategies, and academic performance[17]. The Learning Self-Efficacy Scale developed by Bian provided a reliable and effective instrument for measuring this construct and examining its role in students' academic adjustment[18].

Existing research suggests that academic burnout may undermine students' confidence in their learning abilities and their sense of control over academic tasks, thereby reducing their self-efficacy levels[19]. Conversely, students with higher levels of self-efficacy are more likely to demonstrate persistence and positive coping strategies when encountering academic difficulties, which in turn enhances their academic satisfaction[20]. Self-efficacy enables students to perceive academic challenges as manageable and attainable, thereby promoting positive evaluations of their learning experiences and outcomes.

Based on the above theoretical and empirical evidence, self-efficacy may serve as a mediating mechanism through which academic burnout influences academic satisfaction. Specifically, academic burnout may decrease students' self-efficacy, which subsequently lowers their level of academic satisfaction.

2.3 Mediating Role of Social Support

Social Support Theory posits that social support refers to the material and emotional resources individuals receive from their families, friends, and broader social environments[21]. Zimet et al.[22] introduced the concept of Perceived Social Support, emphasizing individuals' subjective perceptions of the availability and adequacy of support rather than the objective amount of support received. It is important to distinguish between social support as an objective resource and perceived social support as a subjective cognitive evaluation. This distinction is critical because perceived social support has been shown to have a stronger and more direct impact on individuals' psychological well-being and academic outcomes than objective support measures. Therefore, the present study focuses on perceived social support to better understand the psychological mechanisms linking academic burnout to

academic satisfaction.

Cheng et al. suggested that social support can help university students alleviate psychological stress, improve academic adjustment, and enhance psychological well-being[23]. Through a meta-generalization analysis of the Perceived Social Support Scale, Chen et al. further confirmed that the scale demonstrates satisfactory reliability and validity among Chinese university students, indicating its suitability for assessing perceived social support in this population[24].

According to the Buffering Model of Social Support[9,21], social support can mitigate the adverse effects of stressful life events on individuals. When university students experience academic burnout, support from family members, peers, and teachers may effectively reduce negative emotional experiences and facilitate the development of positive learning attitudes. Previous studies have shown that perceived social support significantly enhances university students' life satisfaction[23], which may subsequently contribute to higher levels of academic satisfaction. Furthermore, students who perceive greater support from their social networks are more likely to maintain positive attitudes toward their academic experiences despite encountering academic challenges[25].

Therefore, perceived social support may serve as a mediating variable in the relationship between academic burnout and academic satisfaction.

2.4 Relationship between Self-Efficacy and Perceived Social Support

Bandura's Social Cognitive Theory suggests that individuals' cognitive evaluations influence how they interpret and utilize information from their surrounding environments[8]. Individuals with higher levels of self-efficacy are generally more likely to actively seek assistance and effectively utilize available social resources when facing difficulties[8,16].

Previous studies conducted in China have consistently reported a significant positive relationship between self-efficacy and perceived social support. Liang et al. found that university students with higher levels of self-efficacy were more likely to perceive support from family members, peers, and teachers[26]. Similarly, Zhang reported that perceived social support could enhance university students' career adaptability through the improvement of self-efficacy[25]. Furthermore, Ye et al. [27] found that perceived social support was negatively associated with academic burnout among university students, suggesting that social support may serve as an important protective factor against burnout.

According to Conservation of Resources Theory (COR Theory)[10], self-efficacy represents an important internal psychological resource that not only directly influences adaptation outcomes but also facilitates individuals' acquisition and utilization of external social resources. Hobfoll[10] argued that psychological resources tend to coexist and reinforce one another, suggesting that individuals with higher self-efficacy are more likely to possess stronger social support systems. Empirical evidence supports this proposition. For example, Salanova et al.[28] found a reciprocal and reinforcing relationship between personal resources and organizational resources, suggesting the existence of an upward resource gain spiral.

Based on these theoretical perspectives and empirical findings, academic burnout may first diminish university students' self-efficacy, which subsequently reduces their perceived social support and ultimately lowers their academic satisfaction. Therefore, self-efficacy and perceived social support may function as sequential mediators in the relationship between academic burnout and academic satisfaction.

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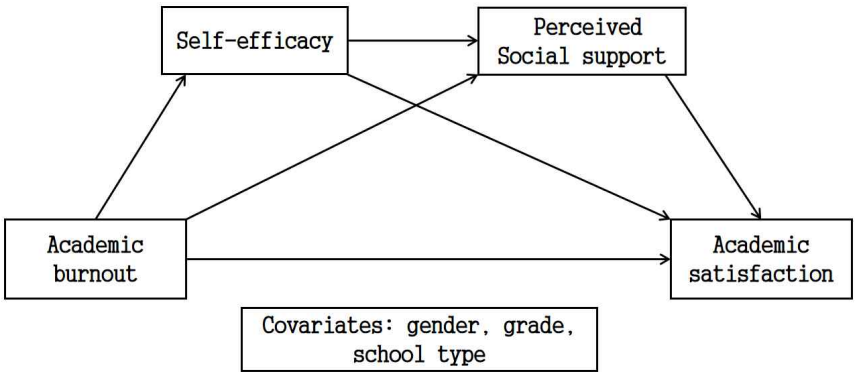
3. Research Methods

3.1 Research Model

The present study aimed to examine the impact of academic burnout on academic satisfaction among university students and to verify the dual mediating roles of self-efficacy and perceived social support. To achieve this objective, Hayes' PROCESS macro model 6 was employed to test the proposed serial mediation model [29]. The conceptual framework of the study is presented in [Figure 1]



[Figure 1] Research model

3.2 Hypothesis

Based on previous empirical findings and the serial multiple mediation model proposed in this study, the following hypotheses were formulated:

H1: Academic burnout negatively predicts academic satisfaction among university students.

H2: Self-efficacy mediates the relationship between academic burnout and academic satisfaction.

H3: Perceived social support mediates the relationship between academic burnout and academic satisfaction.

H4: Self-efficacy and perceived social support jointly exert a serial mediating effect on the relationship between academic burnout and academic satisfaction.

To test this serial mediation model, two additional paths were examined as prerequisites: first, the path from academic burnout to self-efficacy; second, the path from self-efficacy to perceived social support.

3.3 Participants and Data Collection

This study targeted university students enrolled in higher education institutions in China and employed a questionnaire survey to collect data. The formal survey was conducted through Wenjuanxing, a widely used online survey platform in China. The questionnaire link was distributed through university student social networking channels, and convenience sampling was employed to

recruit participants voluntarily.

Data collection was conducted in January 2026 and lasted approximately two weeks. A total of 1,746 questionnaires were collected. To ensure data quality, questionnaires with excessively short response times, obvious response patterns, or substantial missing information were excluded. After data screening, 1,623 valid responses were retained for subsequent statistical analyses.

The demographic characteristics of the participants were as follows. Regarding gender, 71.7% of the respondents were female and 28.3% were male. In terms of institutional type, the majority of participants were enrolled in vocational colleges, accounting for 88.2% of the sample, while undergraduate students accounted for 11.8%. With respect to academic year, first-year students represented 45.0% of the sample, second-year students 36.2%, third-year students 18.3%, and fourth-year students 0.6%. The relatively low proportion of third-year vocational college students and fourth-year undergraduate students may be attributed to their participation in internships or employment preparation activities during the survey period. Regarding academic disciplines, students majoring in humanities and social sciences accounted for 56.8%, science and engineering students accounted for 36.7%, and arts and sports students accounted for 6.5%. Geographically, the majority of participants were from Chongqing, while additional respondents were drawn from several other provinces and municipalities across China.

This study was conducted in accordance with established research ethics principles. Participation was voluntary and anonymous, and informed consent was obtained from all participants prior to data collection. All collected data were used solely for research purposes and were managed under strict personal information protection procedures.

3.4 Research Tools

3.4.1 Academic Burnout

Academic burnout was measured using the Adolescent Student Burnout Inventory developed by Wu et al. [30]. This inventory was developed based on the structure and theoretical framework of the Maslach Burnout Inventory and originally consisted of 16 items covering three dimensions: physical and emotional exhaustion, academic alienation, and reduced sense of academic achievement. Sample items include “My academic performance is too poor, I really want to give up“ and “I feel that learning is meaningless to me.“ The scale adopted a 5-point Likert scale (1=strongly disagree, 5=strongly agree), with some items reverse-coded. Higher total scores indicated higher levels of academic burnout.

Prior to formal analysis, item analysis, reliability testing, and construct validity testing were conducted on the scale. Based on item-total correlations, internal consistency coefficients, and factor loading criteria, items with weak explanatory power or insufficient structural stability were screened and refined. Ultimately, nine items were retained for subsequent analysis. To enhance the stability of variable measurement, the total score of academic burnout was used to represent the overall level of burnout. The Cronbach’s α coefficient for the revised scale was 0.875, indicating good internal consistency reliability and meeting the standards for further statistical analysis.

To further validate the factor structure of the revised 9-item Academic Burnout Scale, a confirmatory factor analysis (CFA) was conducted. The model fit indices indicated an acceptable fit to

the data: χ^2/df =5.166, CFI= .988, TLI= .979, RMSEA= .051. All factor loadings were significant ($p < .001$), providing evidence for the construct validity of the revised scale.

3.4.2 Self-Efficacy

Self-efficacy was measured using the General Self-Efficacy Scale (GSES) developed by Schwarzer and Jerusalem [31] and adapted by Wang et al. [32], which is commonly referred to as the Self-Efficacy Scale. This scale consisted of 10 items, such as "If I try my best, I can always solve problems" and "I can remain calm when facing difficulties." A 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used, with higher scores reflecting higher levels of self-efficacy. In this study, the Cronbach's α coefficient for this scale was 0.947, indicating high internal consistency and good reliability.

3.4.3 Perceived Social Support

Perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet et al. [22], as adapted for the Chinese context by Jiang [33]. The original scale consisted of 12 items covering three dimensions: family support, friend support, and significant other support. Sample items include "When I encounter problems, there is someone who appears by my side" and "My friends can truly help me." During the preliminary analysis or item analysis process, one item with a low factor loading or poor reliability contribution was deleted, resulting in 11 items retained for formal analysis. The original scale used a 7-point Likert scale; however, to maintain consistency with other measurement tools, a 5-point Likert scale was adopted (1=strongly disagree, 5=strongly agree). Higher scores indicated higher levels of perceived social support. In this study, the Cronbach's α coefficient for this scale was 0.959, indicating high internal consistency and good reliability.

3.4.4 Academic Satisfaction

Academic satisfaction was measured using the University Student Academic Satisfaction Scale developed by Li and Wang [12], which was adapted based on the Adolescent Student Life Satisfaction Scale developed by Zhang et al. [34]. The scale consisted of 12 items, such as "I believe that the knowledge I have learned is useful" and "I am satisfied with most of the teachers' teaching activities." A 5-point Likert scale (1=strongly disagree, 5=strongly agree) was used, with some items reverse-coded. Higher scores indicated higher levels of academic satisfaction. In this study, the Cronbach's α coefficient for this scale was 0.945, indicating good reliability.

3.4.5 General Characteristics and Control Variables

To minimize the potential impact of individual background variables on the research results, gender, grade level, and school type were included as control variables in the statistical analysis. Gender was categorized as male or female; grade level included freshman, sophomore, junior, and senior; and

school type was classified as regular undergraduate institution or higher vocational college. These variables were entered into the regression model as dummy variables for control purposes, thereby enhancing the stability and explanatory power of the results.

In addition, participants' major field of study, place of residence, and whether they were an only child were surveyed to gain a more comprehensive understanding of the sample's basic characteristics.

3.5 Data analysis

Statistical analyses were performed using SPSS version 25.0 and the SPSS PROCESS Macro version 4.2. Frequency analysis was conducted to describe the overall sample characteristics; reliability analysis was performed to test the internal consistency of the scales; Pearson correlation analysis was employed to examine the relationships among the main variables; and PROCESS Macro Model 6 was used to test the dual mediation effects.

4. Research Results

4.1 Correlation among Variables

To clarify the relationships among the main research variables, Pearson correlation analysis was conducted to examine the associations among academic burnout, self-efficacy, perceived social support, and academic satisfaction. The results are presented in 〈Table 1〉 and <Table 2>.

The analysis revealed significant correlations among all major variables. Specifically, academic burnout was significantly negatively correlated with self-efficacy ($r=-0.423$, $p< 0.01$), with perceived social support ($r = -0.421$, $p<0.01$), and with academic satisfaction ($r=-0.493$, $p< 0.01$). Among these, the negative correlation between academic burnout and academic satisfaction was the strongest.

Furthermore, self-efficacy was significantly positively correlated with perceived social support ($r=0.678$, $p <0.01$) and with academic satisfaction ($r=0.720$, $p<0.01$). Perceived social support was also significantly positively correlated with academic satisfaction ($r=0.758$, $p<0.01$). Among the positive correlations, the relationship between perceived social support and academic satisfaction was the highest.

According to the descriptive statistics, the mean score for academic burnout was 2.52, indicating a relatively low level; the mean scores for self-efficacy and perceived social support were 3.64 and 3.85, respectively, both above the moderate level; and the mean score for academic satisfaction was 3.87, suggesting that the participating university students generally held a positive evaluation of their current learning status.

Before proceeding with the mediation analysis, multicollinearity among the variables was examined. As shown in Table 2, the variance inflation factor (VIF) values for all predictors ranged from 1.047 to 1.971, and tolerance values ranged from .507 to .955, all within the recommended thresholds (VIF< 5, tolerance > 0.2). These results indicate that multicollinearity was not a serious concern in this study.

The significant correlations observed among the variables provide initial support for H1, and satisfy the necessary statistical prerequisites for testing H2 and H3 (i.e., the correlations between academic burnout and self-efficacy, between self-efficacy and perceived social support, and between the mediators and academic satisfaction).

Overall, the significant correlations among academic burnout, academic satisfaction, self-efficacy, and perceived social support provided a statistical foundation for further testing the sequential dual mediating role of self-efficacy and perceived social support in the relationship between academic burnout and academic satisfaction.

〈Table 1〉 Correlations among Study Variables and Descriptive Statistics

	1	2	3	4
1. Academic Burnout	1			
2. Self-Efficacy	-.423**	1		
3. Perceived Social Support	-.421**	.678**	1	
4.Academic Satisfaction	-.493**	.720**	.758**	1
M	2.516	3.643	3.847	3.870
SD	0.578	0.721	0.777	0.666

Note. **p<.01; M=Mean; SD=Standard Deviation.

〈Table 2〉 Multicollinearity diagnostics

Variable	Tolerance	VIF
Academic Burnout	.784	1.275
Self-Efficacy	.507	1.971
Perceived Social Support	.512	1.952
Gender	.955	1.047
Grade	.941	1.063
School Type	.915	1.093

Note. All VIF values were below 5, and tolerance values were above 0.2, indicating no serious multicollinearity.

4.2 Dual Mediation Effect

To test the sequential dual mediating role of self-efficacy (M1) and perceived social support (M2) in the relationship between academic burnout (IV) and academic satisfaction (DV), this study employed the SPSS PROCESS Macro Model 6 developed by Hayes. The results are presented in [Figure 2] and <Table 3>.

First, academic burnout (IV) had a significant negative effect on self-efficacy (M1) (B=-0.464, p<0.001); simultaneously, academic burnout (IV) also had a significant negative effect on perceived social support (M2) (B=-0.186, p<0.001). Furthermore, academic burnout had a significant negative total effect on academic satisfaction (DV) (B=-0.538, p<0.001). After including the mediators, the direct effect remained significant (B=-0.168, p<0.001), indicating that self-efficacy and perceived social support partially mediated the relationship between academic burnout and academic satisfaction.

The analysis of the simple mediating effect of self-efficacy (M1) showed that academic burnout had a significant negative effect on self-efficacy (B=-0.464, p<0.001), while self-efficacy had a significant

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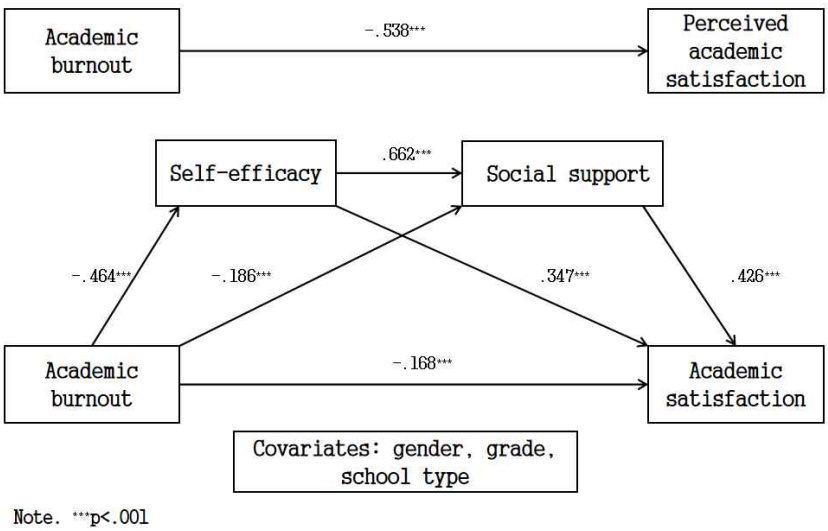
positive effect on academic satisfaction (B=0.347, p<0.001). The indirect effect value was -0.161, with a 95% bootstrap confidence interval of[-0.190, -0.132], which did not include zero, indicating that self-efficacy played a significant mediating role between academic burnout and academic satisfaction.

Similarly, the simple mediating effect of perceived social support (M2) was also confirmed. Academic burnout had a significant negative effect on perceived social support (B=-0.186, p<0.001), and perceived social support had a significant positive effect on academic satisfaction (B=0.426, p<0.001). The indirect effect value was -0.079, with a 95% bootstrap confidence interval of [-0.105, -0.055], which did not include zero, indicating that perceived social support played a significant mediating role between academic burnout and academic satisfaction.

Further analysis of the sequential dual mediation effect revealed that self-efficacy had a significant positive effect on perceived social support (B=0.662, p<0.001), and the sequential indirect effect path of "academic burnout → self-efficacy → perceived social support → academic satisfaction" was significant. The indirect effect value for this path was -0.131, with a 95% bootstrap confidence interval of [-0.154, -0.109], which did not include zero, confirming the presence of a significant sequential dual mediation effect.

In summary, both self-efficacy and perceived social support played significant mediating roles in the relationship between academic burnout and academic satisfaction, and the sequential dual mediation effect consisting of these two variables was also significant. This indicates that academic burnout not only directly reduces university students' academic satisfaction but also indirectly affects it by diminishing their levels of self-efficacy and perceived social support. Thus, all hypotheses (H1, H2, H3, and H4) were supported.



[Figure 2] Statistical model of dual mediating effect

〈Table 3〉 Dual mediating effect of Self-Efficacy and Perceived Social Support

Category	DV: Self-Efficacy			DV: Perceived Social Support			DV: Academic Satisfaction		
	B	SE	t value	B	SE	t value	B	SE	t value
Constant	4.811	0.049	98.184***	1.804	0.058	31.103***	1.448	0.056	25.857***
Academic Burnout	-0.464	0.027	-17.180***	-0.186	0.026	-7.103***	-0.168	0.020	-8.376***

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Self-Efficacy					0.662	0.024	27.595***	0.347	0.025	13.880***
Perceived Social Support								0.426	0.023	18.522***
Covariates	Gender	0.144	0.039	3.703***	-0.080	0.033	-2.419*	-0.017	0.023	-0.737
	Grade	0.030	0.022	1.389	-0.050	0.019	-2.686**	-0.020	0.015	-1.305
	School Type	-0.162	0.055	-2.963**	-0.020	0.044	-0.462	-0.045	0.037	-1.194
Model summary	R^2		0.190			0.488			0.674	
	F		353.19***			548.02***			810.54***	

	Category	Effect	SE	Confidence Interval	
				LLCI	ULCI
	Total effect	-0.538	0.023	-0.585	-0.492
	Direct effect	-0.168	0.020	-0.207	-0.129
	Total indirect effect	-0.370	0.021	-0.412	-0.331
Indirect effect	Academic Burnout → Self-efficacy → Academic Satisfaction	-0.161	0.015	-0.190	-0.132
	Academic Burnout → Perceived Social Support → Academic Satisfaction	-0.079	0.013	-0.105	-0.055
	Academic Burnout → Self-efficacy → Perceived Social Support → Academic Satisfaction	-0.131	0.012	-0.154	-0.109

Note. *p<.05,**p<.01, ***p<.001; LLCI = Lower Level Confidence Interval; ULCI = Upper Level Confidence Interval; DV = Dependent Variable; B = Unstandardized coefficient.

5. Discussion and Conclusion

This study investigated the mechanism through which academic burnout affects academic satisfaction among Chinese university students and examined the sequential dual mediating role of self-efficacy and perceived social support. The results showed that academic burnout significantly and negatively predicted academic satisfaction; that is, the higher the level of academic burnout, the lower the students' satisfaction with their learning process and outcomes. This finding is consistent with previous studies [3,15], indicating that academic burnout has become an important risk factor affecting university students' learning experiences.

Further analysis revealed that self-efficacy played a significant mediating role in the relationship between academic burnout and academic satisfaction. Academic burnout weakened students' confidence in their own learning abilities, and lower levels of self-efficacy further reduced their academic engagement and academic satisfaction. This result validates Bandura's social cognitive theory [8,16] and aligns with existing research demonstrating that academic self-efficacy promotes learning adaptation and academic development [1,20].

In addition, the mediating role of perceived social support was also supported, and this finding is consistent with previous research [25].

More importantly, this study further confirmed the sequential dual mediating effect of self-efficacy and perceived social support. Specifically, academic burnout not only directly reduced students' academic satisfaction but also weakened their perception of social support resources by first reducing their self-efficacy, ultimately leading to lower academic satisfaction.

The mechanism through which self-efficacy translates into perceived social support deserves further elaboration. According to social cognitive theory, individuals with higher self-efficacy are more likely to

approach challenges with confidence and persistence, which in turn increases their likelihood of seeking help when needed and maintaining positive social interactions. These proactive behaviors naturally strengthen their social networks and enhance their perception of available support. Conversely, students with lower self-efficacy tend to doubt their own abilities and may withdraw from social situations, leading to reduced social interactions and a diminished sense of being supported. Thus, self-efficacy functions not only as a personal resource but also as a catalyst for mobilizing external social resources.

The findings of this study should also be interpreted within the specific context of Chinese higher education. As noted earlier, Chinese university students operate under intense academic pressure stemming from the highly competitive Gaokao system and societal expectations for academic success. This unique environment may amplify the negative effects of academic burnout on self-efficacy and, consequently, on perceived social support. Moreover, the relatively lower social recognition of vocational education in Chinese society may further exacerbate the sense of alienation and reduced social support among vocational college students, who represented a substantial proportion of the sample. Therefore, while the proposed mediation model is theoretically grounded, its applicability to other cultural or educational contexts requires further validation. Future research could examine whether the same mediating mechanisms operate similarly in individualistic Western cultures or in other collectivistic Asian societies.

Based on the findings, universities should pay attention to the issue of academic burnout among students by optimizing course arrangements, strengthening mental health education, and improving academic support services to reduce academic pressure. At the same time, efforts should be made to cultivate students' self-efficacy and establish a supportive system involving family, peers, and teachers to enhance university students' academic satisfaction and overall development. Future research may adopt longitudinal designs to further validate the causal relationships among the variables and incorporate additional variables such as learning engagement and psychological capital to construct more comprehensive theoretical models.

Nevertheless, this study has several limitations. First, data were collected using convenience sampling, and the sample was predominantly drawn from higher vocational colleges in the Chongqing region. While vocational college students represent a significant segment of China's higher education population, their educational experiences, academic pressure, and learning resources may differ from those of students at regular undergraduate universities. Therefore, caution should be exercised when generalizing the findings to other regions or different types of higher education institutions. Second, all variables were measured through self-report questionnaires administered at a single time point. Therefore, the influence of common method bias cannot be completely ruled out. Future studies may employ multi-source data collection approaches to further reduce potential method bias and enhance the robustness of the findings. Third, this study employed a cross-sectional design, which does not allow for strong causal inferences regarding the relationships among the variables. Future research could adopt longitudinal follow-up designs to further examine the dynamic relationships among the relevant variables. Fourth, future research could incorporate additional psychological and contextual variables, such as grit, psychological capital, and learning engagement, to develop a more comprehensive theoretical framework explaining academic satisfaction among university students.

In summary, this study confirmed that academic burnout has a significant negative impact on university students' academic satisfaction, and that self-efficacy and perceived social support not only mediate this relationship individually but also form a sequential dual mediation mechanism. These findings reveal the internal psychological pathways through which academic burnout affects academic satisfaction, enrich the theoretical explanation of the relationship between academic burnout and academic satisfaction, and provide empirical evidence to support universities in their efforts to promote student academic support and mental health enhancement.

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The Mediating Role of Self-Efficacy in the Relationship Between Growth Mindset and Career Adaptability among Chinese Vocational College Students: The Moderated Mediation Effect of Employment Anxiety

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중국 고등직업대학 학생의 성장 마인드셋과 진로적응성의 관계에서 자기효능감의 매개역할: 취업불안의 조절된 매개효과

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Abstract: This study aimed to investigate whether employment anxiety moderates the mediating role of self-efficacy in the relationship between growth mindset and career adaptability. Data were collected from 1743 students in Chinese vocational colleges. Data analysis was conducted using SPSS PC+ Ver. 25.0 and SPSS PROCESS macro Ver. 4.2, employing frequency analysis, reliability analysis, correlation analysis, and moderated mediation effect analysis. The results were as follows: First, growth mindset, self-efficacy, and career adaptability were all significantly positively correlated with each other, while employment anxiety was significantly negatively correlated with these positive variables. Second, self-efficacy mediated the relationship between growth mindset and career adaptability. Third, employment anxiety moderated the mediating effect of growth mindset on career adaptability through self-efficacy. Specifically, employment anxiety weakened the positive effect of growth mindset on self-efficacy, and further reduced the indirect effect of growth mindset on career adaptability via self-efficacy. We discuss practical strategies to enhance career adaptability by fostering growth mindset and self-efficacy while alleviating employment anxiety.

Keywords: growth mindset, self-efficacy, career adaptability, employment anxiety, moderated mediation effect

초 록: 본 연구는 취업불안이 성장 마인드셋과 진로적응성의 관계에서 자기효능감의 매개적 역할을 조절하는지 검증하는 것을 목적으로 하였다. 본 연구는 중국 내 직업전문대학 재학생 1,743명을 표본으로 선정하여 설문조사 데이터를 수집했다, SPSS PC+ Ver. 25.0과 SPSS PROCESS macro Ver. 4.2를 사용하여 빈도분석, 신뢰도 분석, 상관분석 및 조절매개효과 분석을 실시하였다. 연구 결과는 다음과 같다. 첫째, 성장 마인드셋, 자기효능감 및 진로적응성은 서로 유의미한 정적 상관관계를 보였으며, 취업불안은 이들 긍정 변인들과 유의미한 부적 상관관계를 나타냈다. 둘째, 자기효능감은 성장 마인드셋과 진로적응성의 관계를 매개하는 것으로 확인되었다. 셋째, 취업불안은 자기효능감을 통한 성장 마인드셋의 진로적응성에 대한 매개효과를 조절하는 것으로 나타났다. 구체적으로, 취업불안은 성장 마인드셋이 자기효능감에 미치는 긍정적 영향을 약화시켰으며, 이로 인해 성장 마인드셋이 자기효능감을 경유하여 진로적응성에 미치는 간접효과 역시 감소시켰다. 본 연구는 성장 마인드셋과 자기효능감을 증진하고 취업불안을 완화함으로써 진로적응성을 제고하기 위한 실천적 방안을 논의하였다.

핵심어: 성장 마인드셋, 자기효능감, 진로적응성, 취업불안, 조절된 매개효과

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1. Introduction

In recent years, with rapid technological development, industrial restructuring, and increasing uncertainty in the labor market, university students face more challenges in their career development [1]. Career adaptability, as an important psychosocial resource, facilitates individuals' adaptive responses to career tasks, career transitions, and uncertainties in career development [1-3]. For vocational college students who are about to enter the labor market after graduation, career adaptability is of great significance for their career development. Existing studies have shown that career adaptability not only affects individuals' career exploration and career decision-making [4,5], but is also closely related to employability, career success, and life satisfaction [5,6]. However, research on the formation mechanism of career adaptability remains relatively limited, especially empirical studies targeting Chinese vocational college students.

Growth mindset and self-efficacy are two psychological resources that can facilitate the development of individuals' career adaptability. Growth mindset refers to the belief that one's abilities can be continuously improved through effort and learning [7]. Individuals with a growth mindset tend to view challenges as opportunities for growth and adopt more positive coping strategies when facing difficulties [8]. Self-efficacy, defined as an individual's belief in their ability to successfully complete tasks [9], may be an important psychological mechanism linking growth mindset and career adaptability. According to social cognitive theory, self-efficacy plays a core role in regulating individuals' motivation, emotion, and behavior [9,10]. Existing studies have shown that individuals with higher levels of growth mindset exhibit greater persistence, self-confidence, and adaptability [8], while self-efficacy significantly promotes the development of career adaptability [10].

Meanwhile, employment anxiety has become a prevalent psychological issue among university students. Previous studies have indicated that vocational college students generally face greater employment pressure than students from traditional four-year universities due to relatively lower educational credentials, limited access to employment resources, and stronger labor market competition [11]. Consequently, employment anxiety may be particularly salient among vocational college students and may hinder their career development and adaptation processes [12]. Higher levels of employment anxiety may undermine individual confidence and reduce the effectiveness of positive psychological resources [12]. Therefore, employment anxiety may moderate the relationship between growth mindset and self-efficacy.

Although existing research has explored the relationship between growth mindset and career adaptability, the following shortcomings remain. First, Although Komarraju and Nadler (2013) found that self-efficacy mediates the relationship between growth mindset and academic achievement, it remains unclear whether this mediating mechanism extends to the career domain, particularly among vocational college students. [13]. Second, whether employment anxiety, as an important contextual factor, moderates the mediating process of growth mindset on career adaptability through self-efficacy has not been examined. Given the increasing employment pressure faced by Chinese vocational college students, employment anxiety may represent a particularly salient contextual factor influencing the effectiveness of positive psychological resources. Third, research targeting Chinese vocational college students is scarce, and this group faces greater pressure in the job market, giving the formation mechanism of their career adaptability particular relevance.

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Therefore, this study aims to explore the mediating role of self-efficacy in the relationship between growth mindset and career adaptability, and further examine the moderating role of employment anxiety, thereby revealing the psychological mechanisms underlying career adaptability among Chinese vocational college students. Specifically, this study proposes the following research questions: First, are growth mindset, self-efficacy, employment anxiety, and career adaptability significantly correlated? Second, does self-efficacy mediate the relationship between growth mindset and career adaptability? Third, does employment anxiety moderate the indirect effect of growth mindset on career adaptability through self-efficacy? This study provides both theoretical insight and practical strategies for enhancing vocational college students' career adaptability.

2. Theoretical Background

2.1 Relationship between Growth Mindset and Career Adaptability

Growth mindset refers to the psychological belief that one's abilities and intelligence can be continuously improved through effort, learning, and persistent practice [7]. Dweck [7] argues that individuals with a growth mindset maintain a positive attitude and sustained effort when facing difficulties and setbacks. Existing research has shown that growth mindset promotes higher levels of learning motivation, persistence, and psychological resilience, thereby enhancing individuals' environmental adaptability and developmental potential [8].

According to Savickas [1], career adaptability consists of four dimensions: concern, control, curiosity, and confidence. Individuals with higher career adaptability actively plan their future career development (concern), believe in their ability to make career choices (control), actively explore career environments and possibilities (curiosity), and trust their ability to solve problems in career development (confidence). Existing research has found that career adaptability not only affects individuals' career exploration and career decision-making behaviors, but is also closely related to employability, career success, and life satisfaction [5].

From a theoretical perspective, growth mindset and career adaptability share a developmental orientation. Growth mindset emphasizes self-improvement through continuous learning and effort, while career adaptability emphasizes the ability to actively cope with various changes and challenges in the career development process. Therefore, growth mindset may be an important psychological resource that promotes the formation of career adaptability. Existing empirical research supports this view: individuals with higher levels of growth mindset are more willing to engage in career exploration and exhibit stronger career adaptability and career development confidence [14]. Moreover, the positive cognitive pattern embodied by growth mindset helps individuals maintain an open attitude during career decision-making and career transitions, thereby enhancing their ability to cope with career uncertainty [14].

2.2 Mediating Role of Self-Efficacy

According to Bandura's social cognitive theory [9], Self-efficacy not only influences individuals' cognitive activities and emotional responses but also determines their level of effort and persistence

when facing difficulties. Research shows that individuals with higher self-efficacy generally exhibit stronger goal-directed behavior, more positive problem-solving strategies, and greater environmental adaptability [9].

2.2.1 Relationship between Growth Mindset and Self-Efficacy

Growth mindset is an important antecedent of self-efficacy. According to Dweck [7], individuals who believe abilities can be improved through effort tend to attribute failure to temporary learning processes rather than to fixed lack of ability. This positive cognitive pattern enhances confidence in one's own development, thereby increasing self-efficacy. When facing challenges, those with a growth mindset view setbacks as learning opportunities, maintaining or even strengthening their ability beliefs [8]. Empirical studies have consistently supported this relationship. Komarraju and Nadler [13] found that growth mindset positively predicts academic self-efficacy. Using a Chinese sample, Zeng et al. [15] reported that growth mindset enhances self-efficacy among students. Burnette et al. [16] further confirmed this link meta-analytically. Therefore, vocational college students with higher growth mindset are more likely to develop stronger career-related self-efficacy.

2.2.2 Relationship between Self-Efficacy and Career Adaptability

Social cognitive theory points out that self-efficacy is an important psychological mechanism affecting individuals' career development [9,10]. Career construction theory indicates that the development of career adaptability depends on individuals' positive evaluation of their own abilities [2]. When individuals believe they can effectively complete career development tasks, they are more likely to exhibit adaptive behaviors such as career planning, career exploration, and career decision-making. Guan et al. [14] found that in a study of Chinese university graduates that self-efficacy significantly promotes the development of career adaptability and improves employment outcomes and career development levels. Furthermore, individuals with higher self-efficacy are more likely to persist in the face of career challenges and proactively seek problem-solving strategies, thereby enhancing their career adaptability.

2.2.3 Mediating Mechanism of Self-Efficacy

Based on the above analysis, growth mindset may further promote career adaptability by increasing levels of self-efficacy. In other words, self-efficacy may mediate the relationship between growth mindset and career adaptability. Specifically, growth mindset helps individuals establish a positive belief that "abilities can be developed"; this belief enhances individuals' confidence in their own abilities (self-efficacy), and higher self-efficacy in turn prompts individuals to actively cope with career development tasks, thereby improving career adaptability. Although existing studies have separately examined the relationships between growth mindset and self-efficacy and between self-efficacy and career adaptability [13], few have simultaneously tested the mediating pathway among all three

2.3 Moderating Role of Employment Anxiety

Employment anxiety refers to the tension, worry, and uncertainty individuals experience when facing job market competition, career choices, and future career development. As job market competition intensifies, employment anxiety has become a prevalent psychological problem for university students, especially those in vocational colleges [12]. Existing research shows that excessive employment anxiety not only affects individuals' mental health but also reduces their career decision-making ability and career adaptability [12].

According to Conservation of Resources Theory [17], negative emotions such as anxiety consume individuals' limited psychological resources, thereby weakening the effectiveness of positive psychological resources. Although growth mindset can promote the formation of positive beliefs, when individuals are in a state of high employment anxiety, their attention tends to focus more on employment risks and the possibility of failure, thus attenuating the positive cognitive effects of growth mindset. In contrast, at lower levels of employment anxiety, individuals are more likely to translate growth mindset into positive ability beliefs and behavioral performance.

Specifically, employment anxiety may moderate the relationship between growth mindset and self-efficacy. Under high employment anxiety conditions, individuals' worries and uncertainty about employment prospects occupy their cognitive resources, hindering the process of transforming growth mindset into ability beliefs; under low employment anxiety conditions, individuals can more fully utilize growth mindset resources to translate them into positive evaluations of their own abilities. Existing research has found that anxiety significantly weakens the facilitating effect of positive psychological resources on individuals' adaptive behaviors [12].

Furthermore, since self-efficacy mediates the relationship between growth mindset and career adaptability, employment anxiety may not only moderate the relationship between growth mindset and self-efficacy but also affect the indirect effect of growth mindset on career adaptability through self-efficacy. When employment anxiety is low, the indirect effect of growth mindset on career adaptability through self-efficacy is stronger; when employment anxiety is high, this indirect effect is weakened.

In summary, based on career construction theory and social cognitive theory, this study constructs a moderated mediation model in which self-efficacy mediates the relationship between growth mindset and career adaptability, and employment anxiety moderates the first stage of the mediation pathway (growth mindset → self-efficacy).

3. Research Methods

3.1 Research Model

This study aimed to explore the mediating role of self-efficacy in the relationship between growth mindset and career adaptability, and further examine the moderating role of employment anxiety in the relationship between growth mindset and self-efficacy. Based on career construction theory and social cognitive theory, a moderated mediation model corresponding to Hayes (2018) [18] PROCESS macro Model 7 was constructed. In this model, growth mindset was the independent variable, career

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adaptability the dependent variable, self-efficacy the mediator, and employment anxiety the moderator.

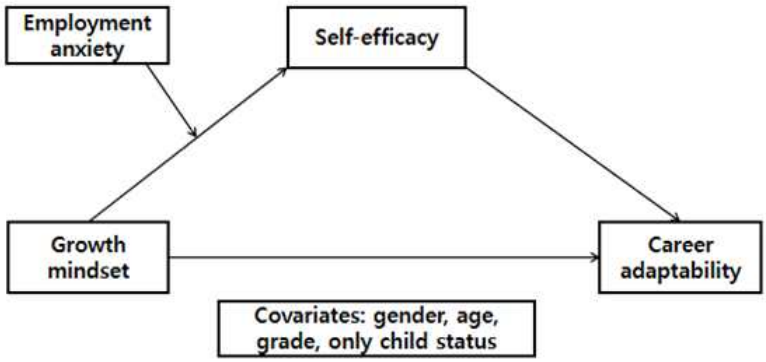

Figure 1. Research model

3.2 Research Hypotheses

Based on career construction theory, social cognitive theory, and relevant empirical findings, the following hypotheses were proposed:

H1: Growth mindset is positively associated with career adaptability.

H2: Self-efficacy mediates the relationship between growth mindset and career adaptability.

H3: Employment anxiety moderates the relationship between growth mindset and self-efficacy. Specifically, as the level of employment anxiety increases, the positive effect of growth mindset on self-efficacy gradually weakens.

H4: Employment anxiety moderates the indirect effect of growth mindset on career adaptability through self-efficacy. Specifically, as the level of employment anxiety increases, this indirect effect gradually weakens.

3.3 Participants and Data Collection

3.3 Participants and Data Collection

This study adopted cluster sampling to recruit participants from vocational colleges located in Chongqing, Sichuan, Guangdong and other regions of China. A total of 1782 questionnaires were initially collected via an online survey platform. All participants were informed of the research purpose before they formally filled out the questionnaires and clearly advised that their responses would only be utilized for academic research. The questionnaire survey was anonymous, participation was completely voluntary, and informed consent was obtained from all participants prior to the formal investigation.This study complied with the ethical principles of the Declaration of Helsinki.

During data screening, missing values, response consistency and questionnaire completion time were examined. Invalid questionnaires with substantial missing items, patterned repetitive responses or excessively short completion durations were eliminated. After screening, 1743 valid questionnaires were retained, corresponding to a valid response rate of 97.81%. The sample covered vocational college

students across different genders, ages and grades, which can adequately reflect the fundamental characteristics of vocational college students in China.

3.4 Measurement Instruments

3.4.1 Growth Mindset

Growth mindset was measured using the Growth Mindset Scale developed by Dweck [7]. The scale consists of eight items assessing individuals' beliefs that intelligence and personality can be developed through effort, learning, and experience. Sample items include "No matter who you are, you can substantially change your intelligence" and "You can always significantly improve your intelligence level." Four fixed-mindset items were reverse-coded before analysis. Responses were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a stronger growth mindset. In this study, the scale demonstrated good internal consistency reliability (Cronbach's α = .891).

3.4.2 Employment Anxiety

Employment anxiety was measured using the Employment Anxiety Questionnaire developed by Zhang and Chen [19]. The scale consists of 26 items across four dimensions (employment competition pressure, lack of employment support, lack of self-confidence, and employment expectation pressure). The scale assesses individuals' concerns and uncertainty regarding future employment and career development. Responses were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater employment anxiety. In this study, the scale demonstrated excellent internal consistency reliability (Cronbach's α = .969).

3.4.3 Self-efficacy

Self-efficacy was measured using the General Self-Efficacy Scale developed by Schwarzer and Jerusalem [20] and revised by Wang et al. [21]. The scale assesses individuals' confidence in their ability to cope with challenges and accomplish tasks successfully. Responses were rated on a 4-point Likert scale, with higher scores indicating greater self-efficacy. In this study, the scale demonstrated excellent reliability (Cronbach's α = .933).

3.4.4 Career Adaptability

Career adaptability was measured using the Career Adapt-Abilities Scale developed by Savickas and Porfeli [22] and validated for Chinese populations by Hou et al. [23]. The scale consists of 24 items across four dimensions: concern, control, curiosity, and confidence. Responses were rated on a 5-point Likert scale, with higher scores indicating greater career adaptability. In this study, the overall Cronbach's α was .969, with subscale reliabilities ranging from .925 to .947.

3.4.5 General Characteristics and Control Variables

Based on existing research, demographic characteristics may be associated with individuals' psychological and career development outcomes. Previous studies have shown that demographic characteristics such as gender, age, and grade may influence career adaptability and self-efficacy. Therefore, gender, age, grade, and only child status were included as control variables to statistically control for their potential effects on the focal variables. Only child status was controlled because family structure may influence career-related resources.

3.5 Data Analysis

Data analysis was performed using SPSS PC+ Ver. 25.0 and SPSS PROCESS macro Ver. 4.2. First, frequency analysis was used to examine the demographic characteristics of the participants. Second, reliability analysis was used to test the internal consistency reliability of each measurement instrument. Third, descriptive statistics and Pearson correlation analysis were used to examine the relationships among the study variables.

To test the moderated mediation model proposed in the research hypotheses, Hayes (2018) [18] PROCESS macro Model 7 was used. The bootstrap method with 5000 resamples was applied to estimate the significance of direct effects, indirect effects, and conditional indirect effects. When the 95% confidence interval (CI) did not contain 0, the effect was considered statistically significant. All continuous variables were mean-centered prior to analysis to reduce the influence of multicollinearity and improve the stability of parameter estimates.

4. Research Results

4.1 Correlation among Variables

Before testing the moderated mediation model, descriptive statistics and Pearson correlation analyses were conducted for the main variables. The means, standard deviations, and correlation coefficients are shown in Table 1.

Descriptive statistics showed that the mean of growth mindset was 3.7158 (SD = .793), the mean of employment anxiety was 2.3213 (SD = .890), the mean of self-efficacy was 3.9554 (SD = .681), and the mean of career adaptability was 3.9542 (SD = .653). The absolute values of skewness and kurtosis for each variable were within acceptable ranges, indicating that the data approximately satisfied the normality assumption.

Correlation analysis showed that growth mindset was significantly positively correlated with self-efficacy ($r = .656$, $p < .01$) and career adaptability ($r = .521$, $p < .01$). Self-efficacy was also significantly positively correlated with career adaptability ($r = .827$, $p < .01$). In contrast, employment anxiety was significantly negatively correlated with growth mindset ($r = -.672$, $p < .01$), self-efficacy ($r = -.390$, $p < .01$), and career adaptability ($r = -.307$, $p < .01$).

These results indicate that students with higher levels of growth mindset also have higher levels of self-efficacy and career adaptability, while students with higher levels of employment anxiety have

relatively lower levels of positive psychological resources. Moreover, the correlation coefficients among the variables did not exceed the criteria for multicollinearity, making subsequent regression analyses appropriate.

Table 1. Correlations among Study Variables and Descriptive Statistics

	1	2	3	4
1. Growth mindset	1			
2. Employment anxiety	-.672**	1		
3. Self-efficacy	.656**	-.390**	1	
4. Career adaptability	.521**	-.307**	.827**	1
M	3.716	2.321	3.955	3.954
SD	.793	.891	.681	.654
Skewness	.527	-.904	.778	.924
Kurtosis	.266	.580	1.468	2.471

Note. ** p < .01; M = Mean; SD = Standard Deviation.

4.2 Moderated Mediation Effect

To test the moderated mediation model proposed in the research hypotheses, SPSS PROCESS macro Model 7 was used. In this model, growth mindset was the independent variable (X), self-efficacy the mediator (M), career adaptability the dependent variable (Y), and employment anxiety the moderator (W), with gender, age, grade, and only child status included as control variables. The analysis results are shown in Tables 2 and 3.

4.2.1 Moderating Effect Analysis

First, the moderating effect of employment anxiety on the relationship between growth mindset and self-efficacy was tested. The regression analysis with self-efficacy as the dependent variable showed that growth mindset significantly positively predicted self-efficacy (B = .620, SE = .043, t = 14.439, p < .001). Meanwhile, the interaction term between growth mindset and employment anxiety was significant (B = -.098, SE = .034, t = -2.850, p = .004), indicating that employment anxiety significantly moderated the relationship between growth mindset and self-efficacy. The overall model explained 45.9% of the variance in self-efficacy (R^2 = .459, F = 119.525, p < .001). The interaction term contributed an additional 1.6% of variance explained (ΔR^2 = .016, F = 8.123, p = .004).

To further interpret the direction of the moderating effect, simple slope analysis was conducted. As shown in Table 2, growth mindset had a significant positive effect on self efficacy at all levels of employment anxiety. Specifically, at low employment anxiety (one standard deviation below the mean, -.892), the effect of growth mindset on self efficacy was strongest (B = .708, SE = .052, t = 13.694, p < .001); at mean employment anxiety (.000), the effect was moderate (B = .620, SE = .043, t = 14.439, p < .001); at high employment anxiety (one standard deviation above the mean, .892), the effect was weakest but still significant (B = .533, SE = .054, t = 9.885, p < .001). These results indicate that employment anxiety weakens the positive effect of growth mindset on self-efficacy, supporting

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Hypothesis H3.

Additionally, the Johnson Neyman technique was used to identify the regions of significance for the conditional effect of growth mindset across the entire range of employment anxiety. The results showed that the positive effect of growth mindset on self-efficacy was significant for all observed values of employment anxiety (from −1.322 to 2.678, all ps < .001). No transition point where the effect became non significant was found within the observed range, indicating that the moderating effect of employment anxiety operates as a gradual weakening rather than a threshold effect

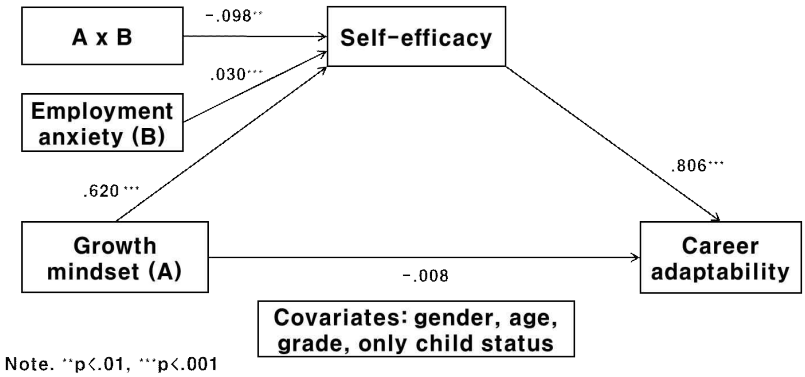

Figure 2. Statistical Model of Moderated Mediation Effect of Employment Anxiety

Table 2. Moderating Effect of Employment Anxiety

Category		DV: Self-efficacy			DV: Career adaptability		
		Coeffect	SE	t value	Coeffect	SE	t value
constant		3.870	.043	89.032***	.894	.088	10.188***
IV(Growth mindset)		.620	.043	14.439***	-.008	.016	-.508
Mediator (Self-efficacy)					.806	.020	39.702***
Moderator (Employment Anxiety)		.030	.031	.978			
Interaction term(GM×EA)		-.098	.034	-2.850**			
Highest order test	R^2 change		.016				
	F		8.123**				
Covariates	Gender	-.127	.029	-4.393***	-.150	.018	-8.218***
	Age	.000	.000	-0.093	.000	.000	0.130
	Grade	.057	.018	3.203**	-.031	.013	-2.473*
	Only child status	.009	.026	0.330	.052	.018	2.881**
Model summary	R^2		.459			.700	
	F		119.525***			474.937***	
Conditional effects of the focal predictor at values of the moderator							

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Employment Anxiety	Effect(B)	se	t value	LLCI	ULCI
-.892 (-1 SD)	.708	.052	13.694***	.606	.809
.000 (Mean)	.620	.043	14.439***	.536	.704
.892 (+1 SD)	.533	.054	9.885***	.427	.638
Conditional effect of focal predictor at values of the moderator					
Employment Anxiety	Effect(B)	se	t value	LLCI	ULCI
-1.322	.750	.061	12.257***	.630	.870
		:			
2.678	.357	.103	3.454***	.154	.560

Note. *p<.05, **p<.01, ***p<.001; LLCI = Lower Level Confidence Interval; ULCI = Upper Level Confidence Interval. Gm; EA

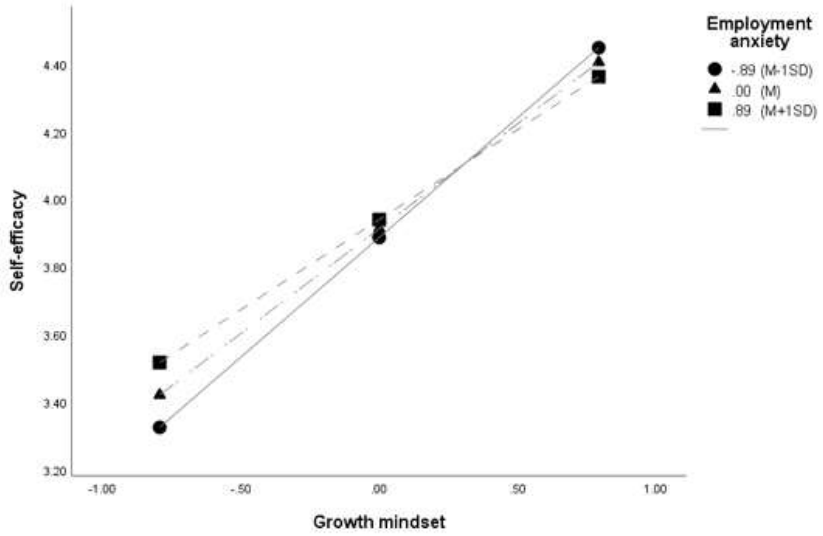

Figure 3. Moderating Effect of Employment Anxiety

4.2.2 Direct Effect and Conditional Indirect Effect Analysis

Next, with career adaptability as the dependent variable, the direct effect of growth mindset and the mediating effect of self-efficacy were tested. The regression results showed that after controlling for self-efficacy, the direct effect of growth mindset on career adaptability was not significant (B = -.008, SE = .016, t = -.508, p = .611), while self-efficacy significantly positively predicted career adaptability (B = .806, SE = .020, t = 39.702, p < .001). The overall model explained 70.0% of the variance in career adaptability (R^2 = .700, F = 474.937, p < .001).

Prior to testing the mediation, the total effect of growth mindset on career adaptability (Hypothesis H1) was examined. The results showed that growth mindset was positively associated with career adaptability (B = .492, SE = .032, t = 15.375, p < .001, 95% CI [.429, .555]), thereby supporting Hypothesis H1. Further, the bootstrap method (5000 resamples) was used to test conditional indirect effects. The results showed that at low employment anxiety (-.892), the indirect effect of growth mindset on career adaptability through self-efficacy was .571 (95% CI [.488, .659]); at mean

employment anxiety (.000), the indirect effect was .500 (95% CI [.427, .574]); at high employment anxiety (.892), the indirect effect was .429 (95% CI [.335, .513]). None of the three confidence intervals contained 0, indicating that the mediating effect of self-efficacy was significant at all levels of employment anxiety. Because the indirect effect was significant and all bootstrap confidence intervals excluded zero, the mediating role of self-efficacy was supported, thereby supporting Hypothesis H2.

Finally, the index of moderated mediation was -.079 (BootSE = .027, 95% CI [-.138, -.033]). Since the confidence interval did not contain 0, the moderated mediation effect was established. Specifically, as the level of employment anxiety increased, the indirect effect of growth mindset on career adaptability through self-efficacy gradually weakened. Thus, Hypothesis H4 was supported.

Table 3. Direct and conditional indirect effect

Direct effect of X on Y				
Effect(B)	se	t value	LLCI	ULCI
-.008	.016	-.508	-.039	.023
Conditional indirect effects of X on Y				
Employment Anxiety	Effect(B)	BootSE	BootLLCI	BootULCI
-.892 (-1 SD)	.571	.043	.488	.659
.000 (Mean)	.500	.037	.427	.574
.892 (+1 SD)	.429	.045	.335	.513
Index of moderated mediation:				
	Index	BootSE	BootLLCI	BootULCI
Employment Anxiety	-.079	.027	-.138	-.033

Note. LLCI = Lower Level Confidence Interval; ULCI = Upper Level Confidence Interval

5. Discussion and Conclusion

Based on career construction theory and social cognitive theory, this study constructed a moderated mediation model to explore the mediating role of self-efficacy in the relationship between growth mindset and career adaptability, as well as the moderating effect of employment anxiety on this mediating pathway. Analysis of survey data from 1743 Chinese vocational college students supported the proposed theoretical model. The findings are discussed below in light of existing research.

First, the correlations among growth mindset, self-efficacy, employment anxiety, and career adaptability were consistent with existing research. This study found that growth mindset was significantly positively correlated with self-efficacy and career adaptability, while employment anxiety was significantly negatively correlated with these positive variables. According to Dweck’s [7] growth mindset theory, individuals who believe abilities can be developed through effort tend to adopt positive coping strategies, thereby enhancing self-efficacy. Meanwhile, social cognitive theory points out that self-efficacy is an important psychological resource influencing career adaptive behaviors [9,10]. These findings are consistent with those of Komarraju and Nadler [13] and Guan et al. [14] Furthermore, the

negative correlations between employment anxiety and the positive variables support Vignoli's [24] finding that anxiety weakens individuals' career adaptability. Therefore, the present findings further confirm that growth mindset and self-efficacy are important psychological resources for promoting vocational college students' career adaptability, while employment anxiety is a hindering factor.

Second, self-efficacy mediated the relationship between growth mindset and career adaptability, indicating a full mediation pattern. Given the cross-sectional design, this finding should be interpreted with caution. Consistent with the full mediation pattern observed in this study, the total effect of growth mindset on career adaptability was significant, but it became non-significant after controlling for self-efficacy, highlighting self-efficacy as an important psychological mechanism. This finding suggests that growth mindset contributes to career adaptability primarily through enhancing individuals' beliefs in their capability to successfully cope with career-related challenges and tasks. This finding is consistent with Komarraju and Nadler's [13] conclusion that growth mindset promotes adaptability by enhancing self-efficacy. Similarly, Guan et al. [14] found that self-efficacy mediates the relationship between career adaptability personality and employment outcomes. The present study extends these findings to the vocational college student population, further validating the core tenet of social cognitive theory that self-efficacy is a key psychological mechanism transforming positive beliefs into adaptive behaviors [9,10]. This result also aligns with Zeng et al. [15] finding among vocational school students that self-efficacy mediates the relationship between motivational factors and career adaptability. In addition, grade showed a significant positive association with self-efficacy, suggesting that senior students tended to report stronger confidence in their abilities. This finding may reflect the accumulation of academic, internship, and career-related experiences throughout vocational education, which gradually enhances students' confidence in dealing with future career tasks.

Third, employment anxiety significantly moderated the relationship between growth mindset and self-efficacy, and further moderated the entire mediating pathway. This study found a significant interaction between growth mindset and employment anxiety, and simple slope analysis showed that as employment anxiety increased, the positive effect of growth mindset on self-efficacy gradually weakened. Moreover, conditional indirect effects decreased with increasing employment anxiety, and the index of moderated mediation was significant. These results support Conservation of Resources Theory [17], which posits that negative emotions such as anxiety consume individuals' psychological resources, thereby weakening the effectiveness of positive psychological resources.

The theoretical contributions of this study are mainly in the following aspects. More importantly, this study integrates Career Construction Theory, Social Cognitive Theory, and Conservation of Resources Theory into a unified framework, providing a more comprehensive explanation of how psychological resources and contextual factors jointly influence career adaptability. First, the findings extend Career Construction Theory by identifying growth mindset as an important antecedent psychological resource that contributes to career adaptability through self-efficacy. This finding broadens the understanding of how adaptive career resources are developed among vocational college students. Second, it validated the mediating mechanism of self-efficacy between growth mindset and career adaptability, enriching the application of social cognitive theory in the field of career development [9,10]. Third, by introducing employment anxiety as a moderator, it revealed how external contextual factors weaken the effectiveness of positive psychological resources, providing a more complete theoretical framework for understanding the formation mechanism of career adaptability. Fourth, focusing on Chinese

vocational college students, it provides empirical evidence for career development research on this group. This study has the following limitations. First, cross-sectional data were used, so causal relationships among the variables cannot be fully determined. Future research could adopt longitudinal designs or experimental intervention designs to further verify causal directions. Second, all variables were measured using self-report questionnaires, which may be influenced by social desirability bias and common method variance. Future studies could incorporate multiple data sources, such as teacher ratings, peer evaluations, or behavioral indicators, to enhance the robustness of the findings. Third, although the sample covered students from several vocational colleges, the participants were concentrated in specific regions of China, which may limit the generalizability of the findings. Therefore, the external validity of the findings needs further testing. Future research could expand the sample to include students from different regions and different types of vocational colleges. Fourth, this study only examined the moderating role of employment anxiety; future research could explore whether other contextual factors (e.g., social support, career decision-making self-efficacy) also play moderating roles in this model.

In summary, this study reveals that self-efficacy mediates the relationship between growth mindset and career adaptability, and that employment anxiety weakens this indirect pathway—a moderated mediation effect uniquely demonstrated in Chinese vocational college students. and that employment anxiety weakens this indirect pathway—a moderated mediation effect uniquely demonstrated in Chinese vocational college students.

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