

国家级一流本科课程

证书



课程类别：线上一流课程

课程名称：心理咨询与心理健康

课程负责人：朱建军

课程团队其他主要成员：田浩、项锦晶、雷秀雅、
杨智辉

主要建设单位：北京林业大学

主要开课平台：爱课程（中国大学 MOOC）



证书编号：2023210110

国家级一流本科课程

证书



课程类别：线下一流课程

课程名称：心理咨询与治疗

课程负责人：雷秀雅

课程团队其他主要成员：田浩、朱建军、杨阳、
杨智辉

主要建设单位：北京林业大学



证书编号：2020130116

荣誉证书

雷秀雅 田 浩 杨智辉 金灿灿 吴宝沛：

健康中国：生态化社会心理服务人才培养体系创建与实践，获 2021 年北京林业大学教学成果奖二等奖。

北京林业大学
二〇二一年九月

荣誉证书

人文社会科学学院 雷秀雅团队，荣获第一届北京林业大学
教师教学创新大赛 正高 组

二等奖

特颁此证。

参赛课程：心理咨询与治疗

团队成员：田浩、杨阳、杨智辉



荣誉证书

雷秀雅 田浩 杨智辉 金灿灿 孙世月：

“两路径-三阶段-四目标”专业课教育环节中大学生素质培养模型，获 2019 年北京林业大学教学成果奖二等奖。

北京林业大学
二〇二一年二月

教育部高等学校科学研究发展中心

中国高校产学研创新基金—贝斯林智慧教育项目 第一批课题资助批复通知

教科发中心函〔2023〕6号

中国高校产学研创新基金资助高校科技/科研处：

经资格预审和专家审核，你校杨智辉申报的“2022年中国高校产学研创新基金—贝斯林智慧教育项目”列入第一批资助课题计划。

接此通知后，请督促课题负责人按照《中国高校产学研创新基金—贝斯林智慧教育项目资助课题计划书》确定的课题研究内容和进度安排，及时开展研究工作，严格遵守资助课题管理、财务等各项规定。如未能按照规定开展相应工作，我中心将依据相关规定随时中止课题的执行。

附件：课题资助批复表

教育部高等学校科学研究发展中心
(教育部科技发展中心代章)

2023年3月16日

附：课题资助批复表

课题名称	生态文明视域下自然教育的智慧化实践平台建设		
课题编号	2022BL042	依托学校	北京林业大学
课题负责人	杨智辉	执行时间	2023年3月1日-2024年2月29
资助经费	10万元（包括5万元的课题经费和5万元的科研软硬件平台）		

教育部产学合作协同育人项目

立项证书



扫码查询真伪

项目编号：**220500643200036**

项目名称：**基于大数据实验教学平台的心理学专业实践基地建设 人工智能应用心理学实验基地建设**

项目负责人：**杨智辉**

学校名称：**北京林业大学**

企业名称：**阿里云计算有限公司**

该项目入选教育部产学合作协同育人项目2022年第二批立项项目，特发此证。



教育部产学合作协同育人项目
cxhz.hep.com.cn

教育部产学合作协同育人项目专家组
2023年2月



北京林业大学 教务处

北京林业大学 2022 年 教育教学改革与研究重大项目 立项通知书

杨智辉 老师：

经专家评审，学校审批，您申报的课题 应用心理学一流专业建设：社会心理服务实践能力的提升研究 被确立为北京林业大学 2022 年教育教学改革与研究 重大 项目。

项目编号： BJFU2022JYZD005

批准经费： 5 万元

项目完成时间： 2024 年 8 月 31 日

请按照《北京林业大学教学研究项目管理办法（2008 年修订）》的要求和您的《北京林业大学教育教学改革与研究项目任务书》中设计的研究内容及研究计划开展项目研究，确保项目按期保质保量完成。所有出版或发表的项目研究成果，须注明“北京林业大学教育教学改革与研究项目”字样和项目编号。

研究项目若有变更等事宜，请与教务处教研科联系。

联系人：崔璨

联系电话：62338328

联系地址：主楼 305

特此通知。



北京林业大学教务处

2022 年 7 月 8 日

联系地址：北京市海淀区清华东路 35 号

邮政编码：100083

联系电话：010-62336058

北京市教育科学规划领导小组办公室

关于北京市教育科学“十四五”规划 2022 年度课题立项的通知

杨智辉同志：

你申请的北京市教育科学“十四五”规划 2022 年度课题，经过专家评审、北京市教育科学规划领导小组审批，已批准立项。课题的具体信息如下：

课题名称：北京市小学生自然接触和自然教育的理论与实践研究

课题负责人：杨智辉

立项编号：BJAA22064

课题类别：重点课题

经费类别：资助

研究方向：教育基础理论研究 研究领域：生态文明教育与可持续发展教育研究

根据规定，课题负责人及所在单位须承担相应责任并执行以下规定：

1. 接此通知后，课题负责人须认真阅读《北京市教育科学规划课题管理办法（京教策〔2020〕13号）》及《北京市教育科学规划课题管理细则》，并严格按照管理办法的规定，按计划开展研究工作，按时完成研究任务、报送研究成果。

2. 请在 10 月 31 日前完成开题，并按要求将开题资料上传至北京市教育科学规划课题管理系统（<http://www.gh.bjedu.cn>）。

3. 对有经费资助的课题，规划办将根据课题负责人在《北京市教育科学规划课题申请书》中编制的“经费预算”总额，在课题立项、中期检查、结题鉴定后，将资助经费分期拨到课题负责人所在单位的银行账户，由所在单位统一管理。

4. 课题实行分级管理，如有《管理办法》第二十一条规定的重要事项变更情形，请依据变更程序逐级报送受理，并由受托管理机构报送我办审批。

立项证书

课题类别：北京市教育科学“十四五”规划2022年度重点课题

课题名称：北京市小学生自然接触和自然教育的理论与实践研究

课题负责人：杨智辉

立项编号：BJAA22064

北京市教育科学规划领导小组办公室

2022年7月19日



中国学位与研究生教育学会农林学科工作委员会

2021 年研究生教育管理立项课题

结题书

课 题 名 称 : 农林院校研究生心理健康危险
因素及其预防和干预

课 题 编 号 : 2021-NLZX-ZD36

课 题 负 责 人 : 杨智辉

所 在 单 位 : 北京林业大学
人文社会科学学院

联 系 电 话 : 13621043150

电子邮箱地址 : zhihuiyang2008@126.com

2024 年 3 月

《课题结题书》填写说明

《课题结题书》包含五部分内容：（1）课题完成情况；（2）成果清单；（3）附件材料；（4）经费使用明细；（5）项目负责人签字及部门审核意见。

一、课题完成情况撰写要求

1、摘要、关键词。简明扼要地概述研究的问题及结论。

2、研究计划要点及具体执行情况。哪些内容按研究计划进行，哪些计划做了调整，哪些计划没有完成，说明原因。

3、研究工作主要进展和所取得的成果。

（1）具体介绍代表性成果，并分别说明其水平和影响，简述其科学价值或指导意义；

（2）必要时，对国内外研究动态和成果进行比较；

（3）列出相应的参考文献。

4、人员分工。根据个人的实际贡献等，概述本项目研究人员的合作与分工。

5、存在的问题、建议及其他需要说明的情况。包括项目研究工作中的难点和经验，本项目研究是否达到预期目标，如未达到，请分析原因和可能的解决途径。今后进一步研究的建议和设想。

二、成果清单（发表时需注明“中国学位与研究生教育学会重点研究课题经费资助”字样或相关字样）

1、专著

按作者、专著名称、出版社、出版时间、版次等顺序列出；

2、期刊论文

按作者、论文名称、期刊名称、年卷期、起止页码、收录情况、被引用情况等顺序列出；

3、会议论文

按作者、论文名称、会议名称、会议时间地点，论文收录情况（文集名称，起止页码）等顺序列出；

4、其他成果

三、附件材料

提供上述成果的原件或复印件。论文需提供发表期刊或文集封面和目录。成果按上述清单顺序排列。

四、项目负责人签字及项目依托单位主管部门签署审查意见

课题完成情况：

1. 摘要与关键词

摘要：研究调查显示，农林院校研究生的心理健康水平显著低于全国研究生的心理健康水平。心理健康问题对于个体的发展至关重要，因此要给予农林院校研究生心理健康情况的高度关注。本课题主要分析了农林院校研究生心理健康危险因素，干预实施要点及效果评估和心理健康问题的预防。结果发现：(1)影响农林院校研究生心理健康的因素有经济压力、科研压力、就业压力、人际交往压力、自身的不良特质等；(2)朋辈心理辅导能有效提升农林院校研究生的心理健康水平并对其身心发展起促进作用；(3)农林院校研究生可以通过自然联结，降低压力知觉的方法减少神经质对心理健康的消极影响，表明自然联结可能在一定程度上预防了心理健康问题的发生。以上结果揭示了影响农林院校研究生心理健康的影响因素并提供了有效的干预方案和预防方法，对于他们的心理健康发展具有重要意义。

关键词：农林院校；心理健康；干预；自然联结；研究生

2. 研究计划要点及具体执行情况

本课题主要包括三个研究内容：(1)农林院校研究生心理健康危险因素分析；(2)农林院校研究生心理健康对症干预及干预要点研究；(3)农林院校研究生心理问题的预防，并形成对应的研究成果(1)发表 1 篇与农林院校研究生心理健康危险因素分析相关的期刊论文；(2)发表 1 篇与农林院校研究生心理危机模式干预相关的期刊论文；(3)将对农林院校研究生的个案干预、团体干预整理编订，形成支持研究生心理健康的干预手册。

本课题已经顺利完成了研究内容(1)农林院校研究生心理健康危险因素分析和(2)农林院校研究生心理健康对症干预及干预要点研究，并在《中国林业教育》上发表了《农林专业研究生心理健康影响因素与对策的分析》(已见刊)和《心理育人视域下高等农林院校朋辈团体心理辅导》(已录用，未见刊)两篇文章。研究内容(3)农林院校研究生心理问题的预防取得的成果包括：(1)会议文章，此心安处是吾乡：农林专业研究生的职业认同研究.中国心理学会. 2022.11.25-27,河南. 第二十四届全国心理学学术会议摘要集. 2022(2):509；(2)会议文章，建设农村社会心理服务体系，助力乡村振兴.中国心理学会. 2022.11.25-27,河南. 第二十四届全国心理学学术会议摘要集. 2022(2):1574；(3)《农林高校研究生心理健康状况调查与原因分析》投稿于《学位与

研究生教育》；(4)《构建农村社会心理服务体系，激发乡村振兴活力--以江西省吉安市七彩岩龙湾为例》和《乡村振兴背景下，高校应用心理人才培养路径探究--基于农村社会心理服务现状的思考》两篇文章已完成，准备投稿；(5)《弘扬脱贫攻坚精神，全面迈向乡村振兴》参与乡村振兴征文活动；(6)《新冠疫情背景下提升应用心理专业硕士社会心理服务能力的培养路径探索》获北京林业大学 2022 年教育教学改革与研究优秀论文一等奖。

综上所述，本课题按照预期计划完成了对应的预期成果，并将研究成果用于实践之中。

3. 研究工作主要进展和所取得的成果

(1)农林院校研究生心理健康危险因素分析

农林类专业由于其学科差异和行业特殊性，农林专业研究生具有与其他专业研究生不同的特点，面临着非比寻常的压力。已有研究表明，农林专业研究生的心理健康水平低于非农林专业研究生。例如，刘丽萍等人(2011)对北京市部分农林院校（北京林业大学、中国农业大学、北京农学院等）的农、林业学科研究生进行调查，调查结果表明与全国常模相比，农林专业研究生除躯体化与人际关系因子外均高于全国成人常模，其中林学院研究生心理状况因子呈阳性的样本比例达到了 63.16%，心理状态较差。西北农林科技大学对本校研究生进行了心理健康调查，结果发现农科学生抑郁心理得分显著高于总体均值 1.14 分，且相比其他专业存在总分大于等于 160 分的学生人数最多(崔宇,2016)。以上结果表明，要加强对农林院校研究生心理健康的关注，探索农林院校研究生心理健康问题的成因，对存在心理健康问题的农林院校研究生进行干预，以及预防心理健康问题的产生。

通过对相关文献查阅和农林院校研究生心理健康现状分析，得出影响农林院校研究生心理健康水平的主要因素有经济压力、科研压力、就业压力、人际交往、研究生自身特质等。针对影响农林院校研究生心理健康的因素，提出了提高农林院校研究生奖助比例、完善心理健康教育体系以及完善就业服务体系三个方面的建议和措施，旨在提高农林院校研究生的心理健康水平。研究结果更加深入地了解农林院校研究生心理健康问题的根源，为具有针对性的问题解决提供了理论支持(李璐涵, 孟弈琳, 杨智辉, 2023)。此外，建议与措施具有可操作性，符合农林院校研究生的现实需求，有益于提升他们的心理健康水平。

(2) 心理育人视域下高等农林院校朋辈团体心理辅导实效的分析

高等农林院校具有学生心理健康水平较低、心理健康教育师资不足的特点，这对高等农林院校实现心理育人目标造成了一定阻碍。朋辈团体心理辅导与高校心理育人的目标、对象、方法具有高度一致性，有利于高等农林院校实施心理健康教育工作，缓解心理健康教育师资不足的压力。例如，上海大学已开始推广建设校内朋辈心理工作室，工作室通过举办单次团体心理辅导与系列团体心理辅导活动，完善高校团体心理辅导模式，该模式也受到了学生的广泛好评(许静，杨秀君,2016)。为分析朋辈团体心理辅导提升高等农林院校学生心理健康水平的效果，结合高等农林院校学生心理特点设计了以人际关系、压力为主题的 7 个结构化、封闭式的朋辈团体心理辅导活动(见下表 1)，对 46 名自愿报名并经过筛选的高等农林院校学生进行辅导。

研究结果发现朋辈团体心理辅导能有效提升高等农林院校学生的心理健康水平，团体成员认为朋辈团体心理辅导对身心健康发展具有促进作用，并对活动的开展给予高度评价。因此，高等农林院校应将朋辈团体心理辅导纳入心理健康教育重点工作内容，同时结合目前存在的问题与不足，从推广朋辈团体心理辅导带领者队伍建设、规范朋辈团体心理辅导带领者培训体系、加大朋辈团体心理辅导宣传力度、完善线上朋辈团体心理辅导平台建设四方面持续提升朋辈团体心理辅导实效。

本研究旨在帮助高等农林院校研究生克服现实压力、充实自我，培育积极的心理品质，探讨朋辈团体心理辅导在高等农林院校施行的更多可能，优化高等农林院校心理健康教育体系。

表 1 7 个朋辈团体心理辅导的活动标题、目标及主要活动内容

主题	子主题	活动标题	活动目标	主要活动内容
人际交往	羞怯	来和害羞做朋友 (六次)	意识到害羞对自己生活的影响,掌握应对害羞的方法,获得一些克服害羞的经历,改善以往因害羞而产生的不良人际交往模式。	价值拍卖、害羞画画、想象模拟、害羞思维导图。
	人际交往能力	我是沟通小能手 (六次)	了解自己的性格、价值观、交往模式等,学习人际交往沟通、矛盾处理等技能,学会处理人际关系中的特殊情况,例如旧友与新友。	邀请你去我的房子、非暴力沟通情景剧表演、你要这样做、烦恼互换。
	校园霸凌	“搬山”——作足够好的我 (六次)	克服校园霸凌对自身人际交往带来的消极影响,重新体验自我,调节自我统一感与自尊水平。提高主动交往的积极性,促进人际交往能力的提升。	我的树、那些光、心理塑像、有我在。
	亲密关系	探索“爱”的真谛 (六次)	明晰对亲密关系的期待,探索亲密关系的寻求之路与相处之道。	手绘亲密关系、爱要大声说出来、夸夸群、面对面拥抱。
压力	压力调节	为心灵减压,与快乐同行 (六次)	寻找调节压力的技巧,习得良好的压力应对方式,改善心理压力状态,减轻心理压力感。降低过高的自我期待,对自我有适应性的评价。	雨中人绘画、我的压力、我想听你说、应对压力事件的分享。
	应对方式	学会应对,悦纳生活 (八次)	识别自动思维、了解认知歪曲、进行认知重构;梳理负面情绪产生的原因,更好地应对自己的激烈情绪;寻求人际支持,发掘自己身边的资源,掌握放松等技巧;改善应对方式,更好地应对压力情境。	压力回忆录、我的自动思维、空椅子、想象放松训练。
	心理弹性	培养强大内心 (Powerful Heart) (六次)	正确认识自我,悦纳自我,发现自己的闪光点,并且努力去提升自己的能力。面对压力与困难时,发现自己身边的社会支持资源,培养积极乐观的心态。	我的挫折黑点、乐观密码、太阳系、我真棒。

(3) 农林院校研究生心理问题的预防

自然联结是个体对其与自然界关系的主观感受,它代表我们如何看待自然,我们对自然的情感,以及我们将自己视为自然的一部分的程度(Martin et al., 2020)。自然联结与个体心理健康有显著关联,首先,自然联结有助于情绪健康,研究发现自然联结水平越高的个体越容易在接触自然环境时感到放松和快乐(Passmore & Howell, 2014),这种愉悦体验同时会促使生活幸福感和生活满意度提高(Capaldi, Dopko, & Zelenski, 2014)。其次,自然联结能够促进个体各项心理功能,例如帮助个体恢复注意力和改善

记忆(许静, 杨秀君, 伍芳辉, 2018)。最后, 自然联结促进个体的社会性发展, Cleary 等人(2017)的研究指出, 高水平的自然联结能够很好地满足个体的内在心理需要, 培养内在价值取向, 能够推动个体实现生活目标(Richardson et al., 2022)。因此, 自然联结的水平越高, 个体的心理发展可能越好(Liu et al., 2022)。

通过对 765 名来自国内农林高校研究生的问卷调查, 结果发现: (1)农学专业研究生的心理健康得分显著低于非农学专业的研究生; (2)导学关系越好, 农林高校研究生的心理健康状况越好; (3)神经质对心理健康的影响, 不仅可以分别通过自然联结和压力知觉发生作用, 而且还通过自然联结→压力知觉呈现的链式关系发生作用, 如下图 1。高校可以通过提高农林高校研究生自然联结, 降低压力知觉的方法减少神经质对心理健康的消极影响, 自然联结可能在一定程度上预防了心理健康问题的发生。

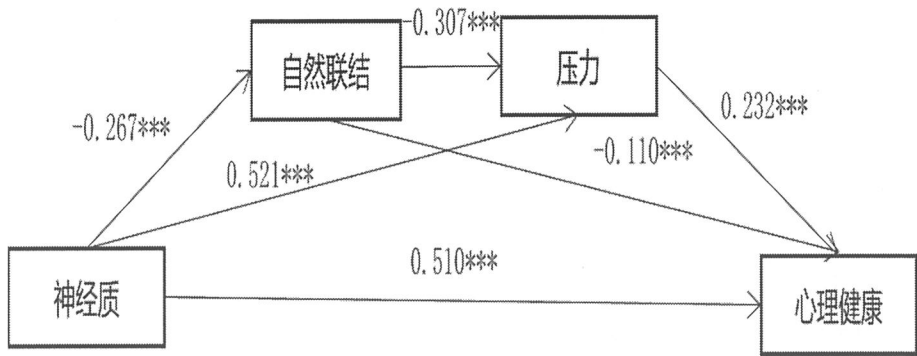


图 1 链式中介分析

本研究聚焦于农林高校研究生, 对其心理健康的影响因素及其作用机制展开探讨, 不仅有助于从心理层面增进对农林高校研究生的理解, 更能从把握生源到构建有益心理健康的课程体系, 全方位为农林高校提供理论支持。

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4. 人员分工（请注明参与人员及变动情况）

姓名	性别	出生年月	职务职称	所在单位	人员分工
杨智辉	男	1981.04	副院长、教授	北京林业大学人文学院	主持、推进
刘祥辉	女	1970.11	心理健康中心主任、副教授	北京林业大学学生心理健康教育中心	指导，心理干预
雷秀雅	女	1962.10	心理健康中心常务副主任、教授	北京林业大学人文学院	指导，心理干预
赵文鹤	女	1989.04	研究生院学位办主任	北京林业大学研究生院	联络联系研究生
吴宝沛	男	1982.12	副教授	北京林业大学人文学院	指导，调研
杨 阳	男	1984.04	人文学院心理学系副主任、副教授	北京林业大学人文学院	指导，调研
陈 慧	女	1990.12	讲师	北京林业大学人文学院	指导，调研
李璐涵	女	1997.11	硕士研究生	北京林业大学人文学院	项目参与
孟奕琳	女	1997.01	硕士研究生	北京林业大学人文学院	项目参与
姜 莉	女	1999.11	硕士研究生	北京林业大学人文学院	项目参与
李正仁	男	1998.02	硕士研究生	北京林业大学人文学院	项目参与
马塘生	男	1996.08	硕士研究生	北京林业大学人文学院	项目参与
于凯丽	女	1996.07	硕士研究生	北京林业大学人文学院	项目参与
陈晓岩	女	1995.06	博士研究生	北京林业大学人文学院	项目参与
李秋怡	女	1998.08	博士研究生	北京林业大学人文学院	项目参与
赵崇池	男	1996.10	博士研究生	北京林业大学人文学院	项目参与

5. 存在的问题、建议及其他需要说明的情况

本课题基本达成了预期目标，取得的成果详见成果清单部分。

难点：(1)受到疫情影响，有些工作未能按照原计划进行。例如，在进行朋辈团体

心理辅导时，晚于计划日期；

(2)农林院校研究生专业认同相对较低，行业发展受限，对自身的心理发展有不良的影响；

(3)在招募农林院校研究生被试时有一定难度，心理健康情况可能相对隐私，导致一些研究生不愿主动加入研究中。

经验：(1)提升农林院校研究生专业认同感：针对农林院校研究生职业认同较低的现状，学校应该针对农林专业研究生专业认同不足的问题开展相关的专业认同教育。例如，教育相关部门应该向广大学生、家长要做好农林业的宣传工作，展现出农林业良好的发展前景，还原真实的农林专业面貌。在专业课的设置上要与国际当前农林业研究领域接轨，引导学生了解学科前沿研究方向，提高学生对专业的自豪感。学校还应多组织学术论坛、沙龙、讲座等专业性强的交流活动，有助于学生更加了解专业领域的动态，同时也为学生提供了与专业学者交流的宝贵机会，激励学生投入更多精力到专业学习中去，从而达到专业认同教育的目的。职业生涯规划讲座或课堂帮助农林类研究生提前思考并明晰自己的未来发展方向。

(2)干预要点：“严格筛选—科学设计—规范流程” 利于干预方案顺利进行，选拔专业素养强、实践经验丰富的朋辈团体心理辅导带领者有利于提升活动效果，“助人—自助—互助”模式凸显参与成员在朋辈团体心理辅导中的主体作用。

(3)提升朋辈团体心理辅导工作实效的实践途径：包括朋辈团体心理辅导带领者组织体系建设、加强和规范朋辈团体心理辅导带领者的培养、完善朋辈团体心理辅导活动，加大宣传力度和完善朋辈团体心理辅导线上平台的建设。

成果清单：

1.期刊论文

(1) 李璐涵，孟弈琳，**杨智辉(通讯作者)**.农林专业研究生心理健康影响因素与对策的分析[J].中国林业教育,2023,41(04):42-51.

(2) 李璐涵，张濯，李正仁，金思宇，杨舒雅，梁柯，刘凯锋，**杨智辉(通讯作者)**. 心理育人视域下高等农林院校朋辈团体心理辅导[J].中国林业教育(已接收，待见刊).

2.会议论文

(1) 马塘生，干欣艳，**杨智辉(通讯作者)**. 此心安处是吾乡：农林专业研究生的职业认同研究.中国心理学会. 2022.11.25-27,河南. 第二十四届全国心理学学术会议摘要集.

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3. 其他成果

(1) 《新冠疫情背景下提升应用心理专业硕士社会心理服务能力的培养路径探索》获北京林业大学 2022 年教育教学改革与研究优秀论文一等奖;

(2) 《弘扬脱贫攻坚精神, 全面迈向乡村振兴》参与乡村振兴征文活动;

(3) 《构建农村社会心理服务体系, 激发乡村振兴活力--以江西省吉安市七彩岩龙湾为例》待投稿;

(4) 《乡村振兴背景下, 高校应用心理人才培养路径探究--基于农村社会心理服务现状的思考》待投稿;

(5) 《农林高校研究生心理健康状况调查与原因分析》投稿于《学位与研究生教育》。

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2024年4月25日

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杨智辉，高蕊，李秋怡：

《后疫情时代辅导员“一柄二叶”心理育人模式的路径探究》荣获北京林业大学2022年教育教学改革与研究优秀论文二等奖。特发此证。



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《乡村振兴背景下，高校应用心理人才培养路径探究——基于农村社会
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杨智辉 胡水 金思宇：

《不同认知特点大学生适应在线学习方式
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2021年12月

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北京林业大学党委研究生工作部

二〇二一年十二月二十三日



第五届中国青年志愿服务项目大赛

银 奖

共青团中央、中央文明办
民政部、水利部
文化和旅游部
国家卫生健康委员会
中国残疾人联合会

二〇二〇年十二月

荣誉证书



奉献·友爱·互助·进步

北京林业大学：

你们申报的“彩虹宝贝特殊儿童心理干预中心志愿服务项目”，在2020年北京市志愿服务项目大赛中荣获金奖。

特发此证，以资鼓励。



荣誉证书

杨智辉 老师：

在2019年全国应用心理专业学位实践技能大赛
中，您所指导的作品荣获 二 等奖，特向您颁发优秀
指导教师奖。

特发此证，以资鼓励。

全国应用心理专业学位研究生教育指导委员会
二〇一九年十二月六日

中国林学会文件

中林会办字〔2023〕50号

中国林学会关于公布自然教育优质 活动课程和优质书籍读本征集结果的通知

各省、自治区、直辖市林学会，各分会、专业委员会，各自然教育学校（基地），各有关单位、机构：

自然教育活动课程和书籍读本受众群体与自然环境建立连接的重要媒介，是影响自然教育成效的关键因素。为深入贯彻落实党的二十大精神，推动我国自然教育事业发展，落实有关工作要求，中国林学会开展了2023年自然教育优质课程、优质书籍读本征集工作。

经各省级林学会及各分会、专业委员会，各自然教育学校（基地），各有关单位、机构推荐，中国林学会组织专家评审，择优选择了“以叶掌木”等64项“自然教育优质活动

课程”；《童趣森林：给孩子的自然故事》等 64 本“自然教育优质书籍读本”。详细目录见附件。

特此通报。

附件：1.自然教育优质活动课程目录

2.自然教育优质书籍读本目录



附件 1：

自然教育优质活动课程目录

（排名不分先后）

序号	活动课程名称	推荐单位
1	以叶掌木	中国林学会水土保持专业委员会
2	鸟儿与深圳湾的约定	红树林基金会
3	水獭游戏家	红树林基金会
4	南药小神农	广东省樟木头林场
5	大自然里的小世界——昆虫旅馆设计师	自然实践设计（北京）有限公司
6	Go Birding Day 观鸟去	GoDay Park 沪灞自然营地
7	小手拉大手 共筑绿色生态	山东林学会
8	无声的节奏	广东深圳华侨城国家湿地公园
9	都市小菜农	广东深圳华侨城国家湿地公园
10	小小“公民科学”调查员	广东深圳华侨城国家湿地公园
11	寻找长在树上的“肥皂”，感受植物清洁的力量	中国科学院武汉植物园
12	亚洲象课堂之与象同行	西双版纳野象谷景区有限公司
13	亚洲象课堂之自然侦探社	西双版纳野象谷景区有限公司
14	蜀葵进百校	成都市植物园（成都市公园城市植物科学研究院）
15	绿道科普嘉年华	成都市植物园（成都市公园城市植物科学研究院）

序号	活动课程名称	推荐单位
16	植物科考夏令营	成都市植物园（成都市公园城市植物科学研究院）
17	《沧桑望东垵》科普剧	景宁畲族自治县鹤溪街道农业农村服务中心（林业站）、景宁畲族自治县景宁中学
18	自然教育美育进校园系列课——自然有色植物染系列	广州市德修教育咨询服务有限公司
19	探索地龙之谜	蒙草生态环境(集团)股份有限公司
20	种子的奇妙之旅	蒙草生态环境(集团)股份有限公司
21	我是昆虫小达人	蒙草生态环境(集团)股份有限公司
22	我和鸟儿做朋友	蒙草生态环境(集团)股份有限公司
23	植物的神秘世界	蒙草生态环境(集团)股份有限公司
24	我与小草共成长	蒙草生态环境(集团)股份有限公司
25	自然教育线下系列课程	祁连山国家公园青海省管理局
26	仙草石斛的奥秘	中国科学院华南植物园
27	甜蜜的小精灵	中国科学院华南植物园
28	太白之野之山缘·蜜缘·林缘	陕西省森林资源管理局
29	微生物王国：看不见的神奇世界	陕西省森林资源管理局
30	“秦”近森林，“岭”略精灵之魅	陕西省森林资源管理局
31	探秘熊猫家园 体验自然之野	陕西省森林资源管理局
32	柏塬之原 奥秘之源	陕西省森林资源管理局

序号	活动课程名称	推荐单位
33	探秘兰谷 遇见兰精灵	深圳市兰科植物保护研究中心
34	孕育希望	台山市甫草林场
35	茁壮成长	台山市甫草林场
36	异木奇珍一睹芳容 爱草护花知行合一	郑州绿博园管理中心
37	大自然的染色工	郑州绿博园管理中心
38	“一起发现”研学活动之夜探公园系列	北京承启文化传播有限公司
39	青山猿鸣，雨林共生	海南省林学会
40	玄武湖生态探秘之旅：观鸟启蒙	中国林学会树木学分会
41	寻找春天的“小不点信使”	上海常菁藤双语幼儿园
42	森林与生命共脉动	甘肃省天水市秦州区林业和草原局森林体验教育中心
43	小鸡孵化	漫森活农场
44	植物拓印	漫森活农场
45	“碳”觅黑水虻世界	
46	自然拓荒者——苔藓	大熊猫国家公园老河沟访客中心
47	“双碳背景下的城市树木保护行动”系列课程	上海市林学会
48	听！美妙的声音	北京林业大学
49	猜猜我是谁——动物习性模仿	北京林业大学

序号	活动课程名称	推荐单位
50	为爱“花”点心思	北京林业大学
51	把自然留在纸上——创意植物拼贴画	北京林业大学
52	留住自然的色彩——植物拓染 DIY 活动	北京林业大学
53	生命起源“藻”知道：揭秘水中微观世界，探寻神奇微藻的奥秘	中科院武汉植物园
54	守护“活”文物	杭州植物园（杭州西湖园林科学研究院）
55	小小神农识百草	杭州植物园（杭州西湖园林科学研究院）
56	森林科学家之神奇动物在哪里	广东象头山国家级自然保护区管理局
57	象头山国家级自然保护区岭南中草药文化主题活动	广东象头山国家级自然保护区管理局
58	秋实—秋拾	江西省林学会
59	水晶猎人	江西省林学会
60	植物园里的神奇植物	深圳市仙湖植物园
61	多肉微景观制作	温岭市林学会
62	生态种植	温岭市林学会
63	植物名片	温岭市林学会
64	气象观测	温岭市林学会

附件 2:

自然教育优质书籍读本目录

(排名不分先后)

序号	书籍读本名称	主编(著)单位/个人	推荐单位
1	童趣森林：给孩子的自然故事	首都绿色文化碑林管理处	首都绿色文化碑林管理处
2	孩子们的自然博物课	余跃	重庆出版社
3	跟着好奇心探索自然	余跃	重庆出版社
4	自然教育孩子的诗	正念自然教育工作室	正念自然教育工作室
5	花映清泉——绿水青山正归来	广东省樟木头林场	广东省樟木头林场
6	心随星海皈自然	三江源国家公园	商务印书馆
7	自然研学课程设计	广东生态工程职业学院、广东省林业事务中心	广东生态工程职业学院
8	我的家在红树林(1-3 年级)、(4-6 年级)、(7-9 年级)	深圳市福田区教育研究中心、深圳市华侨城湿地自然学校	深圳都市娱乐投资公司
9	在城中央(华侨城湿地运营管理及自然教育模式)	广东深圳华侨城国家湿地公园	深圳都市娱乐投资公司
10	家本子	中国儿童中心	中国儿童中心

序号	书籍读本名称	主编（著）单位/个人	推荐单位
11	儿童生态道德教育水主题活动手册	中国儿童中心	中国儿童中心
12	生命·生态·家园 儿童生态道德教育活动指导手册	中国儿童中心	中国儿童中心
13	家·在一起 环境友好的简约生活亲子活动（室内篇、室外篇）	中国儿童中心	中国儿童中心
14	美丽中国 我是小小行动者：“环境友好 儿童友好” 少年儿童生态文明教育活动优秀案例集	中国儿童中心	中国儿童中心
15	淇澳红树林自然教育活动指导手册	珠海市地理与自然教育学会 广东珠海淇澳-担杆岛省级自然保护区管理处	广东省林学会 自然教育专业委员会
16	中德财政合作河北衡水湖湿地保护与恢复项目可持续发展教育（ESD）指南	河北衡水湖国家级自然保护区管理委员会	
17	广东省自然教育工作探索与实践	广东省林业事务中心 全国自然教育网络	广东省林业事务中心
18	观鸟	生态文明（生态道德）教育丛书编委会	武汉市江汉区教育局
19	湿地	生态文明（生态道德）教育丛书编委会	武汉市江汉区教育局
20	自然笔记	生态文明（生态道德）教育丛书编委会	武汉市江汉区教育局
21	绿色中国—自然教育实践手册	湖北生态工程职业技术学院	湖北省林学会
22	自然的美育	李凌	广州市德修教育咨询服务有限公司

序号	书籍读本名称	主编（著）单位/个人	推荐单位
23	留住江豚的微笑：长江江豚环境教育课程	深圳市一个地球自然基金会	中国林业出版社有限公司 世界自然基金会（瑞士）北京代表处
24	祁连山国家公园自然教育系列读本（1-2 年级）	青海省环境教育协会	祁连山国家公园青海省管理局
25	祁连山国家公园自然教育系列读本（3-4 年级）	青海省环境教育协会	祁连山国家公园青海省管理局
26	祁连山国家公园自然教育系列读本（5-6 年级）	青海省环境教育协会	祁连山国家公园青海省管理局
27	祁连山国家公园自然教育系列读本（教师教学背景知识用书）	青海省环境教育协会	祁连山国家公园青海省管理局
28	祁连山国家公园自然教育系列读本（教师教学活动指导用书）	青海省环境教育协会	祁连山国家公园青海省管理局
29	你好，红树林	广东内伶仃福田国家级自然保护区管理局	广东内伶仃福田国家级自然保护区管理局
30	盼归栖——小天鹅的故事	上海市崇明东滩自然保护区管理事务中心	上海科学技术出版社有限公司
31	精灵山谷探险记	深圳市兰科植物保护研究中心	深圳市兰科植物保护研究中心
32	深圳野生兰花	深圳市兰科植物保护研究中心	深圳市兰科植物保护研究中心
33	世界珍奇兰花	深圳市兰科植物保护研究中心	深圳市兰科植物保护研究中心
34	青海西宁湟水国家湿地公园湿地自然教育实践探究	青海西宁湟水国家湿地公园管理服务中心	青海省环境教育协会

序号	书籍读本名称	主编（著）单位/个人	推荐单位
35	青海西宁湟水国家湿地公园湿地解说手册	青海西宁湟水国家湿地公园管理服务中心	青海省环境教育协会
36	青海西宁湟水国家湿地公园常见鸟类观察手册	青海西宁湟水国家湿地公园管理服务中心	青海省环境教育协会
37	北京自然观察手册	北京承启文化传播有限公司	北京承启文化传播有限公司
38	安吉小鲵国家级自然保护区鸟类图鉴	安吉小鲵国家级自然保护区管理中心/安吉县自然资源和规划局/浙江省森林资源监测中心	安吉小鲵国家级自然保护区管理中心
39	安吉小鲵国家级自然保护区珍稀濒危动植物图鉴	安吉小鲵国家级自然保护区管理中心/安吉县自然资源和规划局/浙江省森林资源监测中心	安吉小鲵国家级自然保护区管理中心
40	自然中的植物课堂	上海辰山植物园	上海辰山植物园
41	我身边的自然课	中国科学院武汉植物园、武汉观鸟会	中国科学院武汉植物园
42	家住三江源	青海省林业项目办公室	北京富群社会服务中心
43	森林教育指南（修订版）	中德财政合作贵州省森林可持续经营项目办公室	中国林业出版社有限公司
44	自然教育幼儿园活动指导手册 2	溪谷森林自然教育、北欧营地教育协会	中国林业出版社有限公司
45	人与自然——湿地自然教育	中国生态学会科普工作委员会	中国林业出版社有限公司
46	自然教育通识	深圳赣福文化创意有限公司	中国林业出版社有限公司

序号	书籍读本名称	主编（著）单位/个人	推荐单位
47	嘿，你的生活被这些植物改变了	中科院华南植物园	中国林业出版社有限公司
48	林木食叶害虫野外识别手册	陈淮安	中国林业出版社有限公司
49	超级危险的植物（手绘传奇植物科普丛书）	李晓东 李振基 孙英宝	中国林业出版社有限公司
50	媲美化学工厂的植物（手绘传奇植物科普丛书）	李晓东 李振基 孙英宝	中国林业出版社有限公司
51	鄱阳湖的奇趣生活——鄱阳湖湿地和鸟类保护自然教育读物	江西鄱阳湖国家级自然保护区管理局	中国林业出版社有限公司
52	中国湿地教育中心创建指引（红树林基金会文库）	红树林基金会（MCF）	中国林业出版社有限公司
53	自然解说员培训指南	马红 赵敏燕 邵丹 王书贞 王清春 姚爱静	中国林业出版社有限公司
54	自然体验活动课程案例集	邵丹 张秀丽 赵安琪 马红 赵敏燕 姚爱静	中国林业出版社有限公司
55	纷繁版纳	赵怀东等	中国林业出版社有限公司
56	淘淘日记	张和民 张一 张玲 陈猛	中国林业出版社有限公司
57	大熊猫 201 问	谢浩 周晓	中国林业出版社有限公司
58	后山	张鹏 张睿麟	中国林业出版社有限公司

序号	书籍读本名称	主编（著）单位/个人	推荐单位
59	探秘两栖爬行动物	赵鐸	中国林业出版社有限公司
60	诗经里的昆虫	杨红珍	中国林业出版社有限公司
61	衡水湖观鸟手册	张余广 刘振杰 吴军梅	中国林业出版社有限公司
62	树木疗愈	南海龙 等	中国林业出版社有限公司
63	木化石 远古的记录者	深圳市仙湖植物园	深圳市仙湖植物园
64	户外探索教育系列工具卡	太阳守望者	太阳守望者教育科技有限公司

荣誉证书

CERTIFICATE OF ACHIEVEMENT

杨智辉 老师：

您受邀在北京市社会心理工作联合会举办的“新心理人职业培训”中，讲授《国内外社会心理服务人才培养》被评为优秀课程，为培养专业化、职业化的心理人提供了有力支持。

北京市社会心理工作联合会

二〇二二年八月





感谢信

杨智辉同志：

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Association Between Connection to Nature and Children's Happiness in China: Children's Negative Affectivity and Gender as Moderators

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Abstract

Connection to nature is positively associated with happiness among adults. However, whether and how connection to nature is associated with children's happiness remains unknown. The current study aims to examine the association between connection to nature and children's happiness and the moderating effect of temperament (negative affectivity and effortful control) on this association. Four hundred fifty-eight children aged 7–12 years and one of their parents participated in this study. Our study found that connection to nature is positively associated with both children's self- and parent-reported happiness. Children's negative affectivity moderates the association between connection to nature and self-reported happiness, and the moderating effect differs by gender. Specifically, the negative affectivity of girls strengthens the association between connection to nature and happiness. These findings highlight the positive impact of connection to nature on children's happiness and the importance of considering children's negative affectivity and gender when exploring the association between connection to nature and positive development.

Keywords Happiness · Connection to nature · Negative affectivity · Children

1 Introduction

Most parents desire their children to have continuous happiness, according to a study conducted across 48 countries (Diener & Lucas, 2004). Why do parents want their children to be happy? Happiness increases the likelihood of human survival and procreation, and children's happiness could guarantee the continuation of a family (Grinde, 2004). Additionally, happy children are more likely to exhibit psychosocial adjustment (Davis & Suveg, 2013), academic achievement (Coffey, 2018) and good social relationships (Shin et al., 2011). Given the importance of happiness to racial and individual development, it is crucial to understand which factors are related to children's happiness. Research has found that external factors such as money (Berk, 2018), peer relationships (Alcantara et al., 2017; Baiocco

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et al., 2018; Demir & Weitekamp, 2007) and physical appearance (Holder & Coleman, 2008) are significantly associated with happiness. Compared to these external factors, however, internal factors have stronger associations with happiness (Hayes & Joseph, 2003). Among these internal factors, connection to nature and temperament have received increasing attention. Connection to nature has been found to be positively associated with adults' happiness (Zelenski & Nisbet, 2014). Temperament, including attentional control (Orkibi & Ronen, 2017) and neuroticism (Holder & Coleman, 2008; Holder & Klassen, 2010), has positive and negative associations, respectively, with children's happiness. Unfortunately, it is unclear whether connection to nature is associated with children's happiness or how connection to nature and temperament are associated with children's happiness.

1.1 Children's Happiness

Despite the enduring interest in happiness, there is no consensus on the definition of this concept. Some researchers have defined happiness as individuals' cognitive and affective evaluations of their lives, and the term has frequently been used interchangeably with subjective well-being (Diener, 2000; Feng, 2018; Veenhoven, 2010). From this perspective, happiness consists of high levels of life satisfaction and positive affect and low levels of negative affect (Diener, 2000; Veenhoven, 2010). These researchers used the Satisfaction with Life Scale (Diener, 1994) and the Positive and Negative Affect Schedule (Watson et al., 1988) to assess happiness. Others have argued that happiness is a general positive emotion and includes high levels of positive affect and low levels of negative affect but not high levels of life satisfaction (Deci & Ryan, 2008; Diener, 2006). Specific measures include the Positive and Negative Affect Schedule (Watson et al., 1988), the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999), and the Faces Scale (Holder & Coleman, 2008). Notably, the conceptualization of happiness varies across cultures (Delle Fave et al., 2011). Nevertheless, positive affect is the most frequently mentioned component of happiness among all cultures (López-Pérez et al., 2016; Lu & Gilmour, 2004; Pflug, 2009). In recent years, a growing number of researchers who have devoted attention to happiness, particularly children's happiness, have also agreed that happiness involves high levels of positive affect and low levels of negative affect (Holder & Coleman, 2008; Holder & Klassen, 2010; Holder et al., 2012). They have typically used the Face Scale to assess children's happiness due to its simplicity, straightforwardness, and validity (Holder & Coleman, 2008; Holder & Klassen, 2010; Holder et al., 2012).

Happiness plays a critical role in various aspects of children's positive development. In cross-sectional studies based on child samples, compared with those with lower levels of happiness, children with higher levels of happiness tend to show better physical health (Lyubomirsky et al., 2005; Mahon et al., 2005) and less physical aggression (Orkibi & Ronen, 2019), and they are more likely to be accepted by their peers (Holder, 2012; Shin et al., 2011). In recent longitudinal research, children's happiness significantly and positively predicted academic achievement (Coffey, 2020; López-Pérez & Fernández-Castilla, 2018) and online prosocial behaviors (Erreygers et al., 2019). Given the significance of children's happiness to positive development, previous research has paid more attention to identifying external (Alcantara et al., 2017; Baiocco et al., 2018) and internal factors (Xiang et al., 2019) related to happiness. Internal factors have stronger associations with happiness compared to external factors (Hayes & Joseph, 2003) and their associations with happiness have been increasingly focused. Therefore, the current study explores the

associations between internal factors, including connection to nature and temperament, and children's happiness.

1.2 Association Between Connection to Nature and Children's Happiness

Connection to nature has been defined as an “individual's affective and experiential relationship to nature” (Mayer & Frantz, 2004). The importance of humans' connection to nature has long been emphasized in both Eastern and Western societies. In Chinese society, the ancient philosopher Zhuangzi advocated “*tian ren he yi*”. *Tian* and *ren* refer generally to nature and humanity, respectively. *Tian ren he yi* suggests that nature and humanity compose an organic whole and that humans are inseparable from nature. Similarly, Western ecopsychologist Wilson (1984) offered the biophilia hypothesis, arguing that human beings have an innate need to connect to nature and that satisfying this need through exposure to nature may aid positive development. Some empirical evidence supports Wilson's view and demonstrates that connection to nature is positively associated with adults' happiness and well-being (Capaldi et al., 2014; Cleary et al., 2017; Howell et al., 2013; Nisbet et al., 2011; Pritchard et al., 2020; Zelenski & Nisbet, 2014). For example, in a recent meta-analysis, Capaldi et al. (2014) found that adults who were more connected to nature had higher levels of happiness. Additionally, Nisbet et al. (2011) found that higher levels of connection to nature were associated with higher levels of well-being among adults. Of course, a lack of connection to nature is harmful to physical and mental health. One study found that adults with lower levels of connection to nature were more likely to experience physical and mental illness (Windhorst & Williams, 2015).

In modern societies, humans are gradually moving away from nature, and their connection to nature is being undermined (Aaron & Witt, 2011). This phenomenon is especially obvious in children. Due to parental restrictions and academic pressures, today's children spend less time in nature and have less connection to nature, which leads to the nature deficit disorder (Louv, 2005). Nature deficit disorder represents the detrimental effects on children's physical and mental health resulting from a separation from or a weaker connection to nature. Specifically, children with a weaker connection to nature experience obesity and depression (Louv, 2008) and show less engagement in conservation behaviors (Hughes et al., 2018). In contrast, children with a stronger connection to nature exhibit better self-regulation (Bakir-Demir et al., 2019), mental health (Piccininni et al., 2018), well-being (Laurens et al., 2017), and pro-environmental behaviors (Krettenauer et al., 2020). Although the abovementioned research has examined the associations between connection to nature and many developmental outcomes in children, the association between connection to nature and children's happiness is still unclear. Exploring the association between connection to nature and children's happiness can expand on previous research regarding the factors related to children's happiness.

1.3 Children's Negative Affectivity and Effortful Control as Moderators

Although previous research has found an association between connection to nature and happiness, it is important to recognize that not all individuals are influenced to the same extent by their connection to nature. Indeed, connection to nature explains only a small-to-moderate proportion of the variance in happiness (Capaldi et al., 2014; Howell et al., 2011). This suggests that there are moderators of the association between connection to nature and happiness. To our knowledge, few empirical studies have examined the

moderating mechanisms of this association. In the limited research, sociocultural context has been identified as a moderator of the association between connection to nature and well-being (Cleary et al., 2017). However, almost no study has examined whether internal factors moderate the association between connection to nature and children's happiness. Temperament is an individual trait that differentiates one child from another and is defined as the physiological basis for individual differences in reactivity and self-regulation. Negative affectivity and effortful control are the central components of temperament (Rothbart & Bates, 2006; Rothbart et al., 2001). Specifically, negative affectivity, similar to neuroticism, is the tendency to react to stressors with a high degree of emotionality, including sadness, fear, anger, or discomfort. Effortful control is determined by the efficiency of executive attention, including inhibitory control, attentional control, and perceptual sensitivity (Rothbart & Bates, 2006).

Despite the lack of direct evidence that temperament moderates the association between connection to nature and children's happiness, recent research has found differential levels of both happiness and connection to nature in children with different levels of temperament. Studies using samples of children aged 9–12 years found that children with higher levels of negative affectivity, such as neuroticism and sadness, had lower levels of happiness (Holder & Coleman, 2008; Holder & Klassen, 2010). A study of children aged 10–12 years found that those who had higher levels of effortful control, such as inhibitory and attentional control, experienced higher levels of well-being than those with lower effortful control (Orkibi & Ronen, 2017). Additionally, children with higher negative affectivity are more emotionally dependent on external environments compared to those with lower negative affectivity (Myerberg et al., 2019), which may lead to increased feelings of an emotional connection to external environments including the natural environment (Liefländer et al., 2013). Perceptual sensitivity is core component of effortful control, and children with higher levels of perceptual sensitivity have higher levels of connection to nature than those with lower levels of perceptual sensitivity (Bakir-Demir et al., 2019). Therefore, we speculate that the association between connection to nature and happiness differs by children's negative affectivity and effortful control. Negative affectivity and effortful control may strengthen and weaken, respectively, this association. We believe that a clear understanding of the potential moderating mechanism underlying the association between connection to nature and happiness could provide empirical evidence regarding whether intervention efforts to improve children's connection to nature to promote happiness should consider their temperament.

1.4 Gender and Age Differences

Previous research has examined the gender differences in children's connection to nature, temperament, and happiness. Findings have demonstrated that compared to boys, girls have higher levels of connection to nature (Laurens et al., 2017), neuroticism and effortful control (Lengua & Kovacs, 2005; Xu et al., 2009). However, the findings regarding the gender difference in children's happiness are conflicting. Some researchers, such as Holder and Coleman (2008), have found that girls are happier than boys. Others found no gender difference in children's happiness (Holder et al., 2012; Nguyen & Gordon, 2019). Age differences in children's connection to nature, temperament, and happiness have also been examined. Compared to younger children, older children are more emotionally autonomous within relationships to external environments including natural environments; therefore, they feel higher degrees of separation from and a lower connection to nature (Liefländer

et al., 2013). However, age differences in temperament (Lengua & Kovacs, 2005) and happiness (Nguyen & Gordon, 2019) have not been found. To our knowledge, no studies have examined whether the moderating mechanism underlying the association between the connection to nature and children's happiness differs by gender or age. It is of great importance to identify the gender and age differences in this association mechanism to help explore happiness-promotion strategies tailored by gender and age.

1.5 The Present Study

The present study, using a sample of 458 Chinese children and one of their parents, examined whether connection to nature was associated with children's happiness, whether children's negative affectivity and effortful control moderated the association between connection to nature and happiness, and whether the moderating mechanism differed by the children's gender or age. We used the variable of school grade as a proxy for age. We hypothesized that (1) children's connection to nature is positively associated with their happiness and (2) children's negative affectivity and effortful control strengthen and weaken, respectively, the association between connection to nature and happiness. However, given that evidence on gender and school grade differences in the moderating mechanism is scarce, we did not propose hypotheses on this topic.

2 Method

2.1 Participants

Five hundred thirty-five children aged 7–12 years and one of their parents (52.62% were mothers) from one primary school in the city of Jinan, which is an urban environment, were approached. Seventy-seven chose not to participate. Therefore, 458 children and parents were included in the current study. The mean age of the children was 9.36 years ($SD=0.98$), and 51.30% of them were boys. Regarding the place of residence, 64.41% of the children were from the urban area, and 35.59% were from the surrounding suburban area. Regarding parental education level, 5.46% of the parents had completed primary school or less, 32.75% had a secondary school education, 35.15% had a high school education, 26.42% had completed college, and 0.22% had a postgraduate degree. Regarding employment, 36.46% of the parents were unemployed, 51.31% were working class (e.g., factory worker), and 12.23% had a professional or semiprofessional position (e.g., doctor).

2.2 Measures

The Faces Scale and the Connection to Nature Index (CNI) were developed and are widely used in Western societies to assess children's happiness and connection to nature, respectively. In the current study, they were translated into Chinese by our research team members who are fluent in Chinese and English. These measures were then back-translated into English to assess their compatibility with the original English versions. A small pilot study ($Ns=30$) was performed to determine whether Chinese children and parents had difficulty understanding the items. We found that most of the participants in the pilot study had no difficulty understanding or completing the questionnaires.

2.2.1 The Faces Scale

To provide a comprehensive understanding, children's happiness was rated by both the children and their parents using the Faces Scale (Andrews & Withey, 1976). This scale is a single-item measure ("Overall, how do you usually feel?" or "How would you rate your child's overall happiness?") and depicts seven simple drawings of faces. The children and parents were asked to select the face that best represents their own/their children's feelings on a scale from very unhappy (1, represented by a deeply downturned mouth) to very happy (7, represented by a very upturned mouth). Independent samples *t*-tests indicated that there was no difference in the mothers' and fathers' reports of children's happiness. The Faces Scale has been used widely and has demonstrated adequate reliability and validity (Holder & Coleman, 2008; Holder et al., 2012; Nguyen & Gordon, 2019).

2.2.2 Children's Behavior Questionnaire

We used the very short form of the Children's Behavior Questionnaire (CBQ; Putnam & Rothbart, 2006) to assess the children's negative affectivity and effortful control. The CBQ consists of three subscales: negative affectivity, surgency/extraversion, and effortful control. This study primarily focused on the negative affectivity subscale (12 items; e.g., "gets quite frustrated when prevented from doing something s/he wants to do") and effortful control subscale (12 items; e.g., "sometimes becomes absorbed in a picture book and looks at it for a long time"). Parents responded to each item on a 7-point scale from 1 ("extremely untrue of your child") to 7 ("extremely true of your child"). Parents could also select the option of 0 ("not applicable") if the behavior described was not observed in their children. The subscale scores were calculated by summing the scores of the relevant items, with higher scores indicating higher levels of negative affectivity or effortful control. The CBQ has been used in China (Xu et al., 2009; Zhou et al., 2010). Cronbach's alphas for the negative affectivity and effortful control subscales were 0.71 and 0.73, respectively.

2.2.3 The Connection to Nature Index

Cheng and Monroe (2012) developed the 16-item CNI to assess 8–10-year-old children's affective and experiential relationships with the natural environment. This scale has demonstrated adequate reliability and validity. We modified the CNI in a Chinese sample using an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA). The participants were randomly divided into two subgroups. The EFA was performed on one subgroup, and the CFA was performed on the other. The EFA results showed that three factors with 16 items were extracted from the original scale. Given that items 10 and 14 had substantial cross-loadings on factors 1 and 2 and factors 2 and 3, respectively, they were deleted. Therefore, the scale included 14 items and three factors: personal enjoyment of nature (6 items, e.g., "I like to hear different sounds in nature"), concern for living creatures (3 items, e.g., "I feel sad when wild animals are hurt"), and human-nature interdependence (5 items, e.g., "Humans are part of the natural world"). A CFA was then performed to test the validity of a three-factor solution for the revised CNI. The results showed that the factor loading of item 16 was 0.19. We thus dropped this item and tested the new model. The model showed acceptable fit to the data ($\chi^2/df=1.71$, Comparative Fit Index

(CFI)=0.97, Root Mean Square Error of Approximation (RMSEA)=0.04, Standardized Root Mean Square Residual (SRMR)=0.04).

Cronbach's alpha coefficients were then calculated to evaluate the internal consistency of the CNI. The values were 0.78 for personal enjoyment of nature, 0.62 for concern for living creatures, and 0.49 for human-nature interdependence. We conducted child interviews ($N_s=20$) to better understand why Cronbach's alpha for human-nature interdependence was low. In the interviews, we found that the children had little knowledge of human-nature interdependence, and the content of the items for human-nature interdependence was divorced from their past experiences. Thus, human-nature interdependence (including items 7, 12, 13, and 15) was dropped.

Therefore, the revised Chinese version of the CNI consisted of two dimensions: personal enjoyment of nature and concern for living creatures. The children responded on a 5-point scale from 1 ("strongly disagree") to 5 ("strongly agree"). The scores for the children's connection to nature were calculated by summing the scores for all items, with higher scores indicating higher levels of connection to nature.

2.2.4 Demographic Characteristics

The children reported their gender, age, school grade, and household possessions (e.g., a computer). Following Zhang et al. (2017), we used fourteen household possessions as indicators of family socioeconomic status (SES). The responses for household possessions were summed, and the family SES scores ranged from 0 to 14, with higher scores indicating higher family SES.

2.3 Procedure

The Institutional Review Board of Beijing Forestry University approved the study. We used convenience sampling to recruit participants from one primary school in Jinan, an Eastern Chinese city. We explained the study aims and procedure to class teachers prior to recruitment. With their permission, invitation letters including study information and consent forms were delivered to the children's parents. After obtaining written informed consent from the parents who agreed to participate, the children were asked to complete the self-reported Chinese-language questionnaires during the normal school day. Trained members of the research team supervised the questionnaire administration. Additionally, the children took the parent questionnaires home and returned them to their teachers when their parents had completed them. The teachers submitted these questionnaires to the study team.

2.4 Data Analysis

We conducted the EFA and CFA using SPSS 22.0 and MPLUS 7.0, respectively, to examine and explore the structure of the CNI. The model fit was evaluated using the χ^2/df ratio, the CFI (>0.90 , acceptable; >0.95 , good), the RMSEA (<0.08 , acceptable; <0.05 , good), and the SRMR (<0.08 , acceptable; <0.05 , good) (Hu & Bentler, 1999). We assessed the internal consistency of the CNI and conducted preliminary and moderation analyses using SPSS 22.0. In the preliminary analyses, we calculated the descriptive statistics and the correlations among the main study variables. In the moderation analyses, we used regression analyses to examine the direct associations between connection to nature and children's happiness and then used the PROCESS macro in

SPSS (Hayes, 2014) with the bias-corrected bootstrapped method to examine the moderating effects of negative affectivity, effortful control, and gender. Prior to conducting the moderation analyses, we used the expectation–maximization algorithm to handle missing data (the percentage of missing data for the study variables ranged from 0.66 to 2.83%) and then standardized all the variables. The children’s gender was coded with 0 for male and 1 for female.

3 Results

3.1 Preliminary Analyses

Table 1 shows the means, standard deviations, and bivariate correlations among all the study variables. We conducted a paired samples *t*-test to examine whether there was a discrepancy between the children’s self- and parent-reported happiness. The children’s self-reported happiness was higher than the parent-reported happiness ($t(450) = 3.21$, $p < 0.001$). We conducted Multivariate Analyses of Variance (MANOVAs) with the children’s gender and school grade as independent variables and the children’s happiness as the dependent variable. There were significant main effects of gender for the children’s self-reported and parent-reported happiness ($F(1, 450) = 5.11$, $p < 0.05$, partial $\eta^2 = 0.01$; $F(1, 450) = 8.59$, $p < 0.01$, partial $\eta^2 = 0.02$), with girls scoring higher on happiness than boys. Neither the main effect of school grade nor the gender $\times$ school grade interaction effect for either child- or parent-reported happiness was significant. Therefore, we did not analyze school grade as a moderating mechanism.

The correlations showed that the children’s self- and parent-reported happiness were both significantly and positively correlated with connection to nature and effortful control, but were significantly and negatively correlated with negative affectivity. Connection to nature was significantly and positively correlated with effortful control, but it was not correlated with negative affectivity. Family SES was significantly correlated with both the children’s self- and parent-reported happiness and was used as a control variable in later analyses.

Table 1 Means, standard deviations, and correlation coefficients of the study variables

	1	2	3	4	5	6
1 Happiness-C	–					
2 Happiness-P	0.31***	–				
3 CN	0.42***	0.12*	–			
4 NA	– 0.17***	– 0.21**	– 0.07	–		
5 EC	0.13**	0.14**	0.26***	0.20***	–	
6 SES	0.09*	0.13**	0.16**	– 0.12*	0.01	–
Mean	5.98	5.76	37.86	49.43	58.37	–
SD	1.34	1.25	5.97	10.38	10.21	–

Happiness-C, children’s self-report of their own happiness; Happiness-P, parents’ report of children’s happiness; CN, connection to nature; NA, negative affectivity; SU, surgency/extraversion; EC, effortful control

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

3.2 Moderation Analyses

First, we conducted a regression analysis controlling for the children's gender and family SES to examine the direct associations between connection to nature and the children's self- and parent-reported happiness in the absence of negative affectivity and effortful control. The direct association between connection to nature and the children's self-reported happiness was significant and positive ($B=0.43$, $SE=0.04$, $p<0.001$). However, there was no direct association between connection to nature and parent-reported happiness ($B=0.09$, $SE=0.05$, $p>0.05$).

Then, we applied Model 3 in the PROCESS macro to examine gender differences in the moderating effects of negative affectivity and effortful control on the association between connection to nature and happiness. Moderation analyses were conducted separately for negative affectivity and effortful control and for the children's self- and parent-reported happiness, resulting in four moderation models. Tables 2 and 3 summarize the results of the moderation analyses.

Regarding the gender difference in the moderating effect of negative affectivity on the association between connection to nature and the children's self-reported happiness, as shown in Table 2, connection to nature was significantly and positively associated with the children's self-reported happiness ($B=0.41$, $SE=0.13$, $p<0.01$, 95% CI: [0.152, 0.664]). The effect of the two-way interaction between negative affectivity and connection to nature on the children's self-reported happiness was significant ($B=-0.32$, $SE=0.13$, $p<0.05$, 95% CI: [-0.578, -0.065]), and the effect of three-way interaction among negative affectivity, connection to nature and gender was significant as well ($B=0.25$, $SE=0.10$, $p<0.01$, 95% CI: [0.059, 0.434]), indicating that there were gender differences in the moderating effect of negative affectivity on the association between connection to nature and the children's self-reported happiness.

Regarding gender difference in the moderating effect of negative affectivity on the association between connection to nature and parent-reported happiness, as shown in Table 2, connection to nature was significantly and positively associated with parent-reported happiness ($B=0.28$, $SE=0.14$, $p<0.05$, 95% CI: [0.005, 0.554]). Neither the two-way interaction

Table 2 Regression analyses testing negative affectivity and gender as moderators of the association between connection to nature and happiness

	Children's self-reported happiness			Parent-reported happiness		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Family SES	-0.00	0.03	-0.04	0.04	0.02	1.84
Connection to nature	0.41	0.13	3.14**	0.28	0.14	2.00*
Negative affectivity	-0.10	0.13	-0.71	-0.43	0.14	-2.93**
Gender	0.06	0.09	0.73	0.30	0.09	3.25**
Connection to nature × Negative affectivity	-0.32	0.13	-2.47*	-0.19	0.14	-1.37
Connection to nature × Negative affectivity × gender	0.25	0.10	2.59*	0.08	0.10	0.83

** $p<0.01$; * $p<0.05$

Table 3 Regression analyses testing effortful control and gender as moderators of the association between the connection to nature and happiness

	Children's self-reported happiness			Parent-reported happiness		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Family SES	0.01	0.02	0.43	0.06	0.02	2.51
Connection to nature	0.37	0.14	2.58*	0.28	0.15	1.85
Effortful control	0.01	0.14	0.07	0.24	0.15	1.52
Gender	− 0.02	0.09	− 0.21	0.20	0.10	2.07
Connection to nature × Effortful control	− 0.13	0.12	− 1.15	− 0.08	0.12	− 0.63
Connection to nature × Effortful control × gender	0.10	0.09	1.13	0.07	0.09	0.80

* $p < 0.05$

of negative affectivity with connection to nature ($B = -0.19$, $SE = 0.14$, $p > 0.05$, 95% CI: $[-0.467, 0.083]$) nor the three-way interaction among negative affectivity, connection to nature and gender ($B = 0.08$, $SE = 0.10$, $p > 0.01$, 95% CI: $[-0.117, 0.286]$) was significant. Thus, negative affectivity and children's gender did not moderate the association between connection to nature and the parent-reported happiness.

Regarding gender difference in the moderating effect of effortful control on the association between connection to nature and the children's self-reported happiness, as shown in Table 3, connection to nature was significantly and positively associated with the children's self-reported happiness ($B = 0.37$, $SE = 0.14$, $p < 0.05$, 95% CI: $[0.087, 0.643]$). Neither the two-way interaction of effortful control with connection to nature ($B = -0.13$, $SE = 0.12$, $p > 0.05$, 95% CI: $[-0.359, 0.094]$) nor the three-way interaction among effortful control, connection to nature and gender ($B = 0.10$, $SE = 0.09$, $p > 0.05$, 95% CI: $[-0.071, 0.267]$) was significant. Thus, effortful control and the children's gender did not moderate the association between connection to nature and the children's self-reported happiness.

Regarding gender difference in the moderating effect of effortful control on the association between connection to nature and parent-reported happiness, as shown in Table 3, connection to nature was not associated with parent-reported happiness ($B = 0.28$, $SE = 0.15$, $p > 0.05$, 95% CI: $[-0.018, 0.582]$). Neither the two-way interaction of effortful control with connection to nature ($B = -0.08$, $SE = 0.12$, $p > 0.05$, 95% CI: $[-0.323, 0.167]$) nor the three-way interaction among effortful control, connection to nature and gender ($B = 0.07$, $SE = 0.09$, $p > 0.05$, 95% CI: $[-0.108, 0.257]$) was significant. Thus, effortful control and the children's gender did not moderate the association between connection to nature and parent-reported happiness.

Finally, we ran the PROCESS macro on Model 1 to further clarify the effect of the interaction between connection to nature and negative affectivity on the girls' and boys' self-reported happiness separately, resulting in two moderation models.

As shown in Table 4, for girls, the interaction of connection to nature with negative affectivity was significant ($B = 0.17$, $SE = 0.07$, $p < 0.05$, 95% CI: $[0.036, 0.309]$), but this interaction was not found among the boys ($B = -0.07$, $SE = 0.06$, $p < 0.05$, 95% CI: $[-0.187, 0.039]$). Thus, the girls' but not the boys' negative affectivity moderated the association between connection to nature and self-reported happiness.

Table 4 Regression analyses testing negative affectivity as moderators of the association between connection to nature and children's self-reported happiness

	Girls' self-reported happiness			Boys' self-reported happiness		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Family SES	− 0.01	0.03	− 0.47	0.01	0.03	0.28
Connection to nature	0.43	0.07	6.26***	0.41	0.06	7.06***
Negative affectivity	− 0.20	0.06	− 3.27	− 0.14	0.07	− 2.19*
Connection to nature × Negative affectivity	0.17	0.07	2.49*	− 0.07	0.06	− 1.28

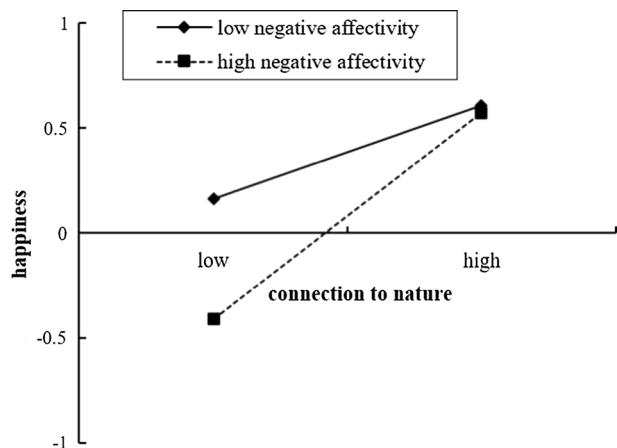
*** $p < 0.001$; * $p < 0.05$

3.3 Simple Slope Analysis

A follow-up simple slope analysis was conducted to understand the nature of the interaction between the girls' connection to nature and negative affectivity. Values at 1 SD above and below the mean of the girls' negative affectivity were used to calculate the simple slopes of the association between connection to nature and the girls' self-reported happiness. Figure 1 depicts the results of the simple slope analysis. The girls' connection to nature was more strongly associated with happiness at higher levels of negative affectivity (simple slope = 0.62, $t = 6.65$, $p < 0.001$) than at lower levels of negative affectivity (simple slope = 0.28, $t = 2.72$, $p < 0.01$).

4 Discussion

In the current study, we explored the association between self- and parent-reports of children's happiness, the moderating effects of negative affectivity and effortful control on the associations between connection to nature and children's happiness, and gender differences in the moderating mechanism. We found a discrepancy between children's

Fig. 1 Girls' negative affectivity moderated the association between connection to nature and happiness

self- and parent-reports of happiness, with the levels of happiness reported by children being higher than those reported by parents. Girls' negative affectivity moderated the association between connection to nature and self-reported happiness. However, boys' negative affectivity and effortful control failed to moderate this association. These findings were conducive to our understanding of the role temperament and gender play in the association between connection to nature and children's happiness.

The current study found a significant difference between self- and parent-reports of children's happiness, and parents underestimated children's happiness. Because happiness, as an emotion, is covert and difficult for others to detect, it is possible that parents are not able to accurately evaluate their children's happiness. According to Lagattuta et al. (2012), this discrepancy may be explained by egocentric bias, with parents reporting their children's emotions using their own emotional states as anchor points. Notably, our finding is inconsistent with previous findings that parents across Western and Eastern societies overestimate their children's happiness (Holder et al., 2012; López-Pérez & Wilson, 2015). Nevertheless, it is difficult to draw any comparisons with the current findings given that neither of the studies referenced above measured parents' emotions. Therefore, future research in which parents report their own and their children's happiness simultaneously is needed.

Consistent with our expectation and the findings of previous research with adult samples (Capaldi et al., 2014; Cleary et al., 2017; Howell et al., 2013), we found that connection to nature is positively associated with children's happiness. This finding lends some support to the biophilia hypothesis (Wilson, 1984) that connection to nature is an innate need and that satisfying this need promotes individuals' positive development. It also extends previous research on the associations between connection to nature and happiness among children aged 7–12 years. Furthermore, our study found that negative affectivity moderates the association between connection to nature and children's happiness. This finding suggests that although human beings have an innate need to feel connected to nature (Wilson, 1984), negative affectivity is an important individual characteristic in terms of how this innate need impacts human development. Children who have higher negative affectivity need emotional support and concern from external environments to relieve negative affect. Therefore, as their feelings of emotional connection to external environments such as natural environments increased, their positive affect increased and their negative affect decreased. In contrast, children with lower negative affectivity usually show fewer negative emotions regardless of whether they have higher levels of connection to nature. Furthermore, a gender difference in the moderating mechanism was found. Specifically, girls' but not boys' connection to nature is more strongly associated with happiness at higher levels of negative affectivity than at lower levels of negative affectivity. Compared to boys, girls are more likely to have higher levels of negative affectivity and then experience negative affect (Lengua & Kovacs, 2005). Therefore, they have an increased emotional connection to nature and a stronger association with increased happiness. These findings provide important insights into the importance of girls' but not boys' negative affectivity to the association between connection to nature and happiness.

Contrary to our expectation, effortful control failed to moderate the association between connection to nature and self-reported happiness. These findings suggest that the association between connection to nature and children's happiness is more likely to be influenced by trait reactivity than by trait self-regulation. However, it is difficult to draw any conclusions from the current study because there are no studies examining the moderating effects of effortful control and negative affectivity on the association between connection to nature and children's happiness. Therefore, further work investigating the mechanism by which

temperament moderates the association between connection to nature and happiness is warranted.

In the current study, we found that neither negative affectivity nor effortful control moderates the association between connection to nature and parent-reported happiness. As discussed above, because parents reporting their children's emotions may use their own emotional states as anchor points, parents' perception of children's happiness may not reflect the reality of their children's happiness in the present study. This may explain why the association between connection to nature and parents' perception of children's happiness was not moderated by temperament. Of course, it remains to be considered in future research whether the critical reason why there was no moderating effect of temperament on the association between connection to nature and parent-reported happiness was that parents were not able to report their children's happiness accurately.

5 Limitations and Future Directions

Although this study provided further understanding of the potential mechanism linking connection to nature and children's happiness, several limitations should be considered. First, our study used a cross-sectional design to examine the association between connection to nature and children's happiness, which means that no causal conclusions regarding the association can be established. Therefore, longitudinal designs are required to determine the direction of the association between connection to nature and children's happiness. Second, the current study sample included children aged 7–12 years and their parents, most of whom came from working- and middle-class families in Jinan, a city in eastern China. Future research is needed to verify whether our findings can be generalized to other groups. Third, we used only the single-item Face Scale to assess children's happiness. Although the reliability and validity of this scale have been documented, it is necessary to replicate this research by employing additional measures in future research. Fourth, previous research has found that social desirability may influence children's self-reports of happiness (Spector, 2006). Therefore, further research is needed to measure social desirability and then reconsider the moderating effects of temperament and gender on the association between connection to nature and happiness after controlling for social desirability. Sixth, it should be noted that both happiness and connection to nature are positively associated with exposure to nature (Bakir-Demir et al., 2019; Dopko et al., 2019). However, this study did not consider the impact of exposure to nature on the association between connection to nature and happiness. Future research should include exposure to nature to provide a more comprehensive picture of the association between connection to nature and happiness and the moderating effect of temperament.

6 Conclusions and Implications

Despite these limitations, the current study was an important attempt to explore whether negative affectivity and effortful control moderate the association between connection to nature and children's happiness as well as whether this moderating mechanism differs with gender. Our study found that connection to nature was positively associated with both girls' and boys' happiness, extending the literature on the association between connection to nature and positive development in the 7–12-year-old age group. Moreover, we found

that girls' but not boys' negative affectivity strengthens the association between connection to nature and self-reported happiness. Our findings suggest that the association between connection to nature and children's happiness differs by temperament and gender. These findings remind us that children's connection to nature, temperament and gender should be considered simultaneously in future interventions striving to promote children's happiness. For girls with higher levels of negative affectivity, future intervention programs aimed at encouraging them to spend more time in nature and improving their level of connection to nature can promote happiness. Additionally, to promote happiness in boys, researchers and practitioners should target improving their level of connection to nature regardless of their temperament.

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Data Availability The raw data of this manuscript will be made available by the authors to qualified researcher.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

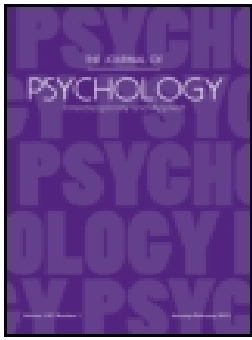
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The Association between Exposure to Nature and Children's Happiness: The Diathesis-Stress or Differential Susceptibility Models?

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The Association between Exposure to Nature and Children's Happiness: The Diathesis-Stress or Differential Susceptibility Models?

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ABSTRACT

Research has demonstrated that both family environments and individual characteristics are associated with children's happiness. However, relatively less research has explored whether and how natural environments are associated with children's happiness. The current study examines whether the association between exposure to nature and children's happiness is moderated by temperament (negative affectivity and effortful control), whether there is a gender difference in the moderating mechanisms, and whether the detected moderation supports the diathesis-stress or differential susceptibility models. Four hundred and ten children and one parent of each child participated in our study. We found that boys' effortful control, not negative affectivity, moderated the association between exposure to nature and happiness. Furthermore, the results support the differential susceptibility model with boys' low effortful control as a vulnerability factor. Specifically, for boys with lower effortful control, a lower exposure to nature was associated with lower happiness, and a higher exposure to nature was associated with higher happiness than in boys with higher effortful control. However, girls' negative affectivity and effortful control did not moderate the association between exposure to nature and happiness. These findings suggest that the association between natural environments and children's positive developmental outcomes varies with their effortful control and gender.

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Happiness; exposure to nature; effortful control; children

Introduction

Wilson (1984) argued that humans evolved over a long period in nature and that they have an innate preference for nature. Recent empirical research supports Wilson's view and has found that children's favorite places are natural environments (Chawla, 2014). However, due to rapid urbanization (Aaron & Witt, 2011), parental restrictions (Hand et al., 2018) and academic pressures (Louv, 2005), children today are spending less time in natural environments and are experiencing less exposure to nature than elder generations. Exposure to nature refers to the direct physical and/or sensory contact with natural environments (Kamitsis & Francis, 2013). Exposure to nature has many

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potential benefits for children, such as lower depression and nervousness (Piccininni et al., 2018), higher self-regulation (Bakir-Demir et al., 2019), and higher pro-environmental behaviors (Collado & Evans, 2019). On the contrary, the lack of exposure to nature is harmful to children's physical and mental health (Dopko et al., 2019; Louv, 2005). Although previous research has found an association between exposure to nature and a range of children's developmental outcomes, less is currently known regarding the association between exposure to nature and children's happiness.

The Association between Exposure to Nature and Children's Happiness

Happiness is hedonic well-being and refers to the presence of positive affect and the absence of negative affect (Deci & Ryan, 2008; Holder & Coleman, 2008). It is the sought-after goal that most individuals strive for (Holder, 2012). Previous empirical research has found that children with higher levels of exposure to nature experience higher levels of well-being and positive affect than children with lower levels of exposure to nature (Berman et al., 2012; Dopko et al., 2019; McMahan & Estes, 2015; White et al., 2013). Two important theories in the research on the human-nature relationship also provide support for the association between exposure to nature and children's happiness. Specifically, **attention restoration theory** (ART; Kaplan & Kaplan, 1989) posits that nature calls forth individuals' involuntary attention and provides respite for overworked directed attention mechanisms. Therefore, exposure to nature alleviates mental fatigue and enhances well-being. In addition, **stress recovery theory** (SRT; Ulrich et al., 1991) postulates that humans are biologically prepared to respond positively to natural and vegetation-rich environments. When exposed to nature, humans produce unconscious autonomic responses characterized by decreased psychophysiological stress and increased positive affect.

The Moderation of Negative Affectivity and Effortful Control in the Association between Exposure to Nature and Happiness: The Diathesis-Stress and Differential Susceptibility Models

Despite the evidence mentioned above that there is a positive association between exposure to nature and children's happiness, not all children are influenced to the same extent by exposure to nature. Indeed, the socio-ecological framework by Lachowycz and Jones (2013) proposes that there are moderators in the association between exposure to nature and well-being. This model identifies the following four types of moderators: demographic factors (such as socioeconomic status), the living context (such as cultural factors), the characteristics of greenspace (such as attractiveness of green space), and climate (such as the temperature). Unfortunately, this model ignores the moderating effects of individual characteristics, particularly temperament. Temperament is an important individual trait that differentiates one child from another (Rothbart et al., 2001). It refers to the physiological basis for individual differences in reactivity and self-regulation (Rothbart & Bates, 2006; Rothbart et al., 2001). Negative affectivity and effortful control are the central components of temperament (Rothbart & Bates, 2006; Rothbart et al., 2001). Negative affectivity, similar to neuroticism, is defined as

the tendency to react to stressors with a high degree of emotionality, including sadness, fear, anger, and discomfort. Effortful control is defined as the efficiency of executive attention, including inhibitory control, attentional control, and perceptual sensitivity (Rothbart & Bates, 2006). Children who are lower on negative affectivity (Holder et al., 2012), higher on inhibitory control, and higher on attentional control (Orkibi & Ronen, 2017) experience higher happiness and well-being.

Recently, the research on children's temperament-environment interactions has been growing and comparing the two theoretical models of diathesis-stress and differential susceptibility (Gao et al., 2018; Myerberg et al., 2019; Rabinowitz et al., 2016a; 2016b; Rioux et al., 2019). These theoretical models suggest that children with vulnerability factors are more susceptible to unsupportive environments than children without these vulnerability factors. According to the diathesis-stress model (Monroe & Simons, 1991), children with vulnerability factors (such as a difficult temperament) are more likely to experience negative developmental outcomes when exposed to unsupportive environments (e.g., negative family environments) than children without these factors, but children with vulnerability factors experience similar developmental outcomes to children without vulnerability factors when exposed to supportive environments (e.g., positive family environments). According to the differential susceptibility model (Belsky & Pluess, 2009), children with vulnerability factors are also more susceptible to both the adverse and positive effects of unsupportive and supportive environments, respectively. To our knowledge, the existing research on the diathesis-stress or differential susceptibility frameworks has primarily focused on the associations between the interactions of temperament with family environments and children's developmental outcomes. For example, Myerberg et al. (2019) found that children with higher levels of negative affectivity experience lower levels of well-being when exposed to lower levels of family cohesion than children with lower levels of negative affectivity, and these children experience similar levels of well-being to children with lower levels of negative affectivity when exposed to higher levels of family cohesion. These findings therefore support the diathesis-stress model. Additionally, Gao et al.'s (2018) study of Chinese children found that children with higher levels of negative affectivity experience not only higher levels of internalizing problems when exposed to higher levels of parental psychological control, but also lower levels of internalizing problems when exposed to lower levels of psychological control than children with lower levels of negative affectivity, which supports the differential susceptibility model. However, almost no research from the diathesis-stress or the differential susceptibility perspectives has investigated the moderating effects of temperament on the association between exposure to nature and children's happiness. A better understanding of the potential moderating mechanism that underlies the association between exposure to nature and happiness could provide evidence on whether intervention programs to improve children's exposure to nature to promote happiness should consider their temperament.

Gender Difference

Notably, previous research has found gender differences in children's happiness, exposure to nature, fearfulness and effortful control, with girls having higher levels of

happiness (Holder & Coleman, 2008), exposure to nature (Piccininni et al., 2018), fearfulness and effortful control (Lengua & Kovacs, 2005; Xu et al., 2009) than boys. Furthermore, the association between exposure to nature and children's developmental outcomes is stronger among girls than boys (Piccininni et al., 2018). Less emphasis, however, has been placed on the gender difference in the potential mechanisms involved in the association between exposure to nature and children's happiness. It is of great importance to ascertain gender differences in the moderating effects of temperament on the association between exposure to nature and children's happiness to develop targeted interventions for happiness according to children's gender.

The Current Study

The present study used a sample of Chinese children aged 7–12 years and examined whether children's negative affectivity and effortful control moderate the association between exposure to nature and happiness, whether there is a gender difference in the moderating mechanisms, and whether the detected moderation supports the diathesis-stress or differential susceptibility models. We hypothesized that (1) negative affectivity and effortful control moderate the association between exposure to nature and children's happiness and that (2) the moderating mechanisms vary by children's gender. However, given that no studies have examined the moderating effects of negative affectivity and effortful control on the association between exposure to nature and happiness with the diathesis-stress or differential susceptibility frameworks, we did not propose hypotheses about this topic.

Method

Participants

Four hundred and fifty-eight children aged 7–12 years and one parent of each child were recruited to participate in this study. Forty-eight children and parents refused to participate. Therefore, the final sample included 410 children and parents. The mean age of the children was 9.37 years ($SD=.96$). Approximately 53.17% of the children were boys. In terms of the place of residency, 65.85% of children were from the urban area, and 34.15% of children were from the suburban area nearby. Regarding parental education level, 2.68% of the parents had a primary school education or less, 33.42% of the parents had a secondary school education, 29.03% of the parents had a high school education, 25.85% of the parents had a college education, and .24% of the parents had a postgraduate education. Regarding employment, 19.76% of the parents were unemployed, 52.19% of the parents were working class (e.g., factory worker), and 19.27% of the parents had a professional or semiprofessional position (e.g., teacher). However, 8.78% of the parents did not report their education level and employment.

Procedure

This study was approved by the Institutional Review Board of Beijing Forestry University. Children and their parents were recruited through convenience sampling from a public

elementary school in Jinan, an eastern Chinese city. Prior to recruitment, the research assistants explained the study aims and procedure to class teachers. With their permission, invitation letters including the study information and consent forms were delivered to the children's parents. After parental consent was obtained, the children completed the self-report measure regarding happiness during a normal school day. Additionally, the children took home a document with measures regarding their exposure to nature and temperament and returned this information to the class teachers when their parents had completed these measures. Finally, the research assistants collected the questionnaires from the class teachers.

Measures

Happiness

Happiness was assessed with the Subjective Happiness Scale (SHS, Lyubomirsky & Lepper, 1999). This scale consists of 4 items (e.g., "Compared to most of my peers, I consider myself"). The children responded by using a 7-point scale from 1 (less happy/not at all) to 7 (more happy/a great deal of the time). The scores for happiness were calculated by summing the responses to the four items, with higher scores indicating higher levels of happiness. This scale has demonstrated good reliability and validity in China (Nan et al., 2014). In this study the alpha was .60. Although not particularly high, the alpha coefficient was similar with those obtained in previous research (Bi et al., 2012).

Exposure to Nature

Amoly et al. (2014) developed the Green Spaces Questionnaire to assess children's exposure to nature. Parents were asked to report the average number of times per week and the average number of hours that their children played in green spaces during the four time periods of school days, weekends, New Year/Christmas, and Easter holidays during the last school period. According to Chinese holidays and the data collection time of this study, we revised this questionnaire. In the revised version, the parents reported the average number of times per week and the average number of hours that their children played in green spaces during the four time periods of school days, weekends, the Mid-autumn Day, and the National day from July to September 2019. For each time period, the hours that children played in green spaces was calculated by multiplying the number of times per week by the hours per play time to obtain weekly average hours and then multiplying these weekly average hours by the number of corresponding weeks. Exposure to nature was calculated by summing the hours during school days, weekends, the Mid-autumn Day, and the National day.

Negative Affectivity and Effortful Control

Negative affectivity and effortful control were assessed with the parents' report of the Children's Behavior Questionnaire-Very Short Form (CBQ-VSF; Putnam & Rothbart, 2006). The CBQ includes the three subscales of negative affectivity, effortful control, and surgency. This study used the negative affectivity (12 items; e.g., "gets quite

frustrated when prevented from doing something s/he wants to do”) and effortful control subscales (12 items; e.g., “when drawing or coloring in a book, s/he shows strong concentration”). The parents responded by using a 7-point scale from 1 (extremely untrue of your child) to 7 (extremely true of your child). They could also select “not applicable” if the description was not observed in their children. The scores were calculated by summing the relative responses, and higher scores indicated higher levels of negative affectivity and effortful control. The CBQ has shown good reliability and validity in China (Fan et al., 2020). In this study, the alphas for the negative affectivity and effortful control subscales were .67 and .71, respectively.

Demographic Variables

The children reported their gender, age and household possessions (e.g., car). We used fourteen household possessions as indicators of family socioeconomic status (SES) (Zhang et al., 2017). The responses of household possessions were summed, with higher scores indicating higher SES.

Statistical Analyses

We used SPSS 22.0 to conduct correlation and regression analyses separately for boys and girls. Prior to conducting the regression analyses, we handled missing data with the expectation-maximization algorithm and standardized the main study variables. We used the regression analyses to examine whether there was a significant effect of the interaction between negative affectivity/effortful control and exposure to nature on happiness. If a significant interaction was found, then we conducted a regions of significance (RoS) analysis to examine the diathesis-stress and differential susceptibility models (Roisman et al., 2012). An RoS analysis identifies three indices, namely, the RoS on the independent variable (RoS on X), the proportion of the interaction (PoI), and the proportion affected (PA). Specifically, an RoS analysis estimates the range of values of the X with which the moderator (Z) and the dependent variable (Y) are significantly associated. If the association between Z and Y is significant at the low end of X, then the results support the diathesis-stress model. If the association is significant at both the low and high ends of X, then the results support the differential susceptibility model. The PoI represents the proportion of the total interaction that is represented on the right side of the crossover point (where the two regression lines intersect) for the interaction. A PoI value closer to .50 supports the differential susceptibility model, and a PoI value closer to .00 supports the diathesis-stress model. The PA represents the proportion of participants above the crossover point. A PA value closer to .50 (.40 – .60) supports the differential susceptibility model, and a PA value closer to .00 supports the diathesis-stress model. We can use an online instrument (<http://www.yourpersonality.net/interaction/>) to calculate the above indices. Additionally, Roisman et al. (2012) recommended examining whether X^2 , ZX^2 and a combination of X^2 and ZX^2 do not significantly predict Y to demonstrate the absence of a nonlinear association between X and Y.

Results

Table 1 shows the bivariate correlations among all study variables for all children, and Table 2 shows the bivariate correlations separately for boys and girls. We conducted analyses of variance (ANOVAs) to examine the gender differences in happiness, exposure to nature, negative affectivity and effortful control. There were significant gender differences in negative affectivity and effortful control, with girls scoring higher than boys on negative affectivity ($F(1,342)=5.81, p<.05$) and effortful control ($F(1,339)=6.29, p<.05$). For boys, happiness was significantly and positively correlated with exposure to nature. Neither negative affectivity nor effortful control was significantly correlated with both happiness and exposure to nature. For girls, happiness, exposure to nature, negative affectivity and effortful control were not significantly correlated with one another.

Tables 3 and 4 summarize the results of the regression analyses. Regarding the moderating effect of negative affectivity, as shown in Table 3, both boys' and girls' exposure to nature were significantly and positively associated with their happiness

Table 1. Correlations Among All Study Variables for All Children.

	1	2	3	4	5	6
1. Happiness	–					
2. Exposure to nature	.19**	–				
3. Negative affectivity	–.06	–.07	–			
4. Effortful control	.05	.04	.04	–		
5. Age	.04	–.02	–.05	–.11	–	
6. SES	.11*	–.04	–.14*	–.02	.03	–

Numbers at the top refer to boys, and numbers at the bottom refer to girls.

** $p<.01$.

* $p<.05$.

Table 2. Correlations Among All Study Variables for Boys and Girls.

	1	2	3	4	5	6
1. Happiness	–	.23**	–.01	.00	.13	.09
2. Exposure to nature	.17	–	–.07	.01	–.03	.00
3. Negative affectivity	–.12	–.03	–	–.04	–.12	–.25**
4. Effortful control	.10	.11	.08	–	–.12	–.01
5. Age	–.07	–.01	.03	–.12	–	.01
6. SES	.14	–.08	.00	–.03	.05	–

Coefficients above the diagonal are the correlations for boys, and coefficients below the diagonal are the correlations for girls.

** $p<.01$.

Table 3. Regression Analyses that Test Negative Affectivity as a Moderator of the Association between Exposure to Nature and Happiness.

	Boys			Girls		
	β	F	ΔR^2	β	F	ΔR^2
Step 1						
Exposure to nature	.28***	9.01***	.08	.21**	5.47**	.06
Negative affectivity	– .00			–.10		
Step 2						
Exposure to nature $\times$ Negative affectivity	.00	5.98**	.00	–.04	3.76*	.00

*** $p<.001$.

** $p<.01$.

* $p<.05$.

Table 4. Regression Analyses that Test Effortful Control as a Moderator of the Association between Exposure to Nature and Happiness.

	Boys			Girls		
	β	F	ΔR^2	β	F	ΔR^2
Step1						
Exposure to nature	.27***	9.01***	.08	.20**	5.21**	.05
Effortful control	.03			.09		
Step 2						
Exposure to nature $\times$ Effortful control	-.17**	8.41***	.03	.05	3.66*	.00

*** $p < .001$.
** $p < .01$.
* $p < .05$.

(boys: $\beta = .28, p < .001$; girls: $\beta = .21, p < .001$). However, the interactions between exposure to nature and negative affectivity were not significant among both boys and girls (boys: $\beta = .00, p > .05$; girls: $\beta = -.04, p > .05$). Thus, both boys' and girls' negative affectivity did not moderate the association between exposure to nature and happiness.

Regarding the moderating effect of effortful control, as shown in Table 4, both boys' and girls' exposure to nature were significantly and positively associated with their happiness (boys: $\beta = .27, p < .001$; girls: $\beta = .20, p < .01$). The interaction between exposure to nature and boys' effortful control was significant ($\beta = -.17, p < .01$). However, the interaction between exposure to nature and girls' effortful control was not significant ($\beta = .05, p > .05$). Thus, boys' but not girls' effortful control moderated the association between exposure to nature and happiness.

We conducted an RoS analysis to examine whether the effect of the interaction between boys' exposure to nature and effortful control on happiness supported the diathesis-stress or the differential susceptibility models. Figure 1 depicts the results of

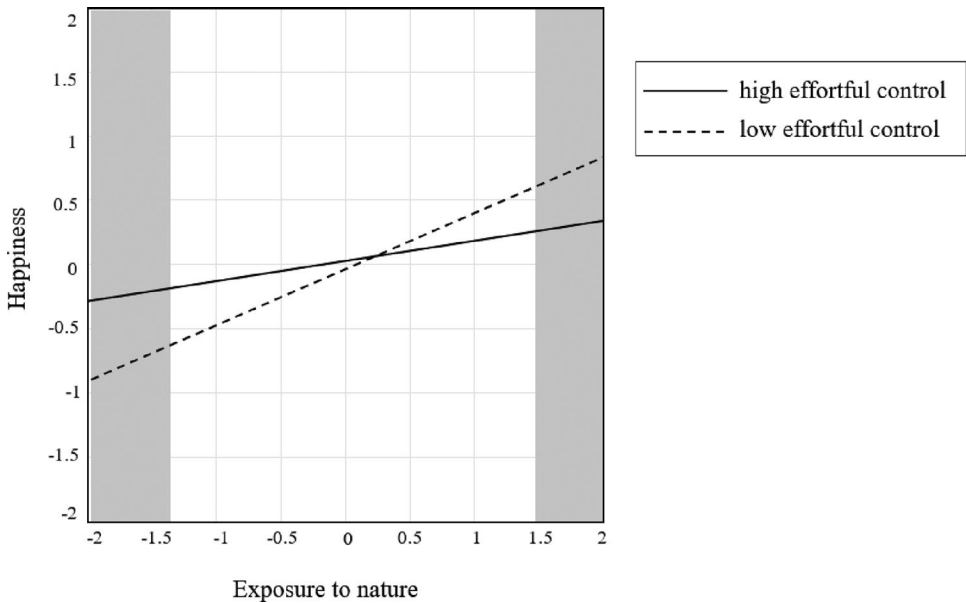


Figure 1. The association between exposure to nature and happiness among children with high (+1 SD) and low (−1 SD) effortful control.

the RoS analysis. The RoS analysis found that the association between effortful control and happiness was significant at both lower and higher levels of exposure to nature, with a lower bound of significance at -1.34 (within $M \pm 2SD$) and a higher bound of significance at 1.42 (within $M \pm 2SD$). The PoI was .40, and the PA was .42. Additionally, we did not find a nonlinear association between exposure to nature and happiness. These findings thus support the differential susceptibility model.

Discussion

The present study expanded on previous research by investigating whether and how exposure to nature is associated with children's happiness in a Chinese sample of children aged 7–12 years. Specifically, we examined whether children's negative affectivity and effortful control moderated the association between exposure to nature and happiness, whether there was a gender difference in the moderating mechanism, and whether the findings from the moderation analyses were consistent with the diathesis-stress or differential susceptibility models. We found that among boys with lower levels of effortful control, lower levels of exposure to nature were associated with lower levels of happiness compared to boys with higher levels of effortful control. However, higher levels of exposure to nature were associated with higher levels of happiness among boys with lower levels of effortful control compared to boys with higher levels of effortful control. These findings support the differential susceptibility model.

In the current study, although exposure to nature was significantly and positively correlated with all children's happiness when calculating the correlation between exposure to nature and happiness for all children, only boys' exposure to nature was significantly correlated with happiness when calculating the correlation between exposure to nature and happiness separately for boys and girls. This suggests that gender plays an important role in the association between exposure to nature and Chinese children's happiness. Our finding is inconsistent with both previous theories and the empirical research conducted in Western societies. According to ART (Kaplan & Kaplan, 1989) and SRT (Ulrich et al., 1991), both boys and girls with higher levels of exposure to nature experience higher levels of happiness. In addition, some empirical research with samples of Canadian and British children found that higher levels of exposure to nature were associated with higher levels of well-being and positive affect among both boys and girls (Dopko et al., 2019; White et al., 2013). It appears that the association between exposure to nature and well-being/happiness found in Western samples does not pertain to our Chinese sample. In modern Chinese society, most parents think that achieving academic success is the primary duty of children (Chao & Tseng, 2002) and that spending time outdoors such as exposure to nature wastes their children's learning time and impedes academic success. Girls who grow up in traditional Chinese families are more susceptible than boys to these ideas and conceptions from parents (Shek, 2007; Zhang & Fuligni, 2006). Therefore, Chinese girls may feel unhappy when exposed to nature. Of course, given that few studies with Chinese samples have examined the association between exposure to nature and children's happiness, drawing conclusions from the current findings should be proceed with caution, and further research that investigates the association between exposure to nature and happiness among other Chinese samples is needed.

Consistent with our expectation, effortful control moderated the association between exposure to nature and happiness among boys. This finding supports Lerner's development contextualism (Lerner, 2006), which suggests that both external environments (such as exposure to nature) and internal characteristics (such as temperament) are important contexts in individuals' development (such as happiness), and the interactions between external environments and individual characteristics affect developmental outcomes. However, our study found that negative affectivity did not moderate the association between exposure to nature and children's happiness, though a moderating effect of negative affectivity on the association between family environments and children's well-being has been found (Myerberg et al., 2019). In Chinese society dominated by collectivism, individual characteristics such as self-regulation, not lower endurance to stressors and higher emotionality, are encouraged and approved (Grimm et al., 1999). Under this cultural atmosphere, it is possible that children with higher negative affectivity fail to experience higher levels of happiness despite exposure to relaxing natural environments. Of course, this conclusion should be considered with caution given that almost no research has explored the moderating effects of negative affectivity and effortful control on the association between exposure to nature and children's happiness.

In addition, we found that lower levels of exposure to nature were associated with lower levels of happiness among boys with lower levels of effortful control compared to boys with higher levels of effortful control, while higher levels of exposure to nature were associated with higher levels of happiness among boys with lower levels of effortful control compared to boys with higher levels of effortful control. These findings support the differential susceptibility model with boys' lower effortful control as a susceptibility factor. Boys who are lower in effortful control have difficulty focusing attention (Kiff et al., 2011). They therefore need to exert considerable effort to avoid distractions, which leads to their directed attention being overworked (Kaplan & Berman, 2010; Kaplan & Kaplan, 1989). If these boys have little opportunity to be exposed to nature, then their involuntary attention cannot be called forth, and their overworked directed attention cannot be relieved. It is therefore possible that they experience higher mental fatigue and lower positive affect (Kaplan & Berman, 2010; Kaplan & Kaplan, 1989). On the contrary, if these boys are exposed to nature, then involuntary attention can be called forth, and their overworked directed attention can be relieved, which is beneficial to recovery from mental fatigue and enhances positive affect.

Several limitations of our study should be considered. First, this study's sample consisted of children aged 7–12 years and one of their parents, who mainly came from working- and middle-class families. Whether our findings can be generalized to other groups requires further investigation. Second, the relatively low reliabilities of the Subjective Happiness Scale and negative affectivity subscale should be acknowledged because they may weaken the association among the variables. Accordingly, it is necessary to replicate our findings in future research by using more reliable measures. Third, happiness, negative affectivity and effortful control may be influenced by social desirability. Thus, more studies are needed to measure social desirability or assess children's happiness and temperament with observational measures and to reconsider the moderation of negative affectivity and effortful control on the association between exposure to nature and children's happiness. Fourth, we relied on

parents' reports of their children's exposure to nature and temperament, which may introduce bias in the estimates of the associations among the study variables. Therefore, it is useful for future research to include both children's and parents' reports of children's happiness, exposure to nature and temperament.

Despite these limitations, the current study is a novel and important attempt to investigate the gender difference in the moderating effects of negative affectivity and effortful control on the association between exposure to nature and children's happiness in China from a diathesis-stress versus differential susceptibility perspective. Our study found that boys with lower effortful control experience lower happiness than boys with higher effortful control when the level of exposure to nature is lower, and they experience higher happiness when the level of exposure to nature is higher, which supports the differential susceptibility model. These findings extend previous research regarding the moderating effects of temperament on the association between external environmental factors and children's happiness. Our findings provide important insights into the importance of boys' effortful control on the association between natural environments and children's positive developmental outcomes. Additionally, these findings emphasize that prevention and intervention efforts aimed at encouraging exposure to nature to promote happiness should consider children's temperament and gender. Furthermore, practitioners should encourage boys, particularly boys with lower effortful control, to be in natural environments.

Disclosure statement

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城市公园环境要素对居民心理健康的影响

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摘要: 为探讨城市公园中自然要素、感知要素、休息要素和活动要素对居民正向情绪、认知功能及心理症状和负向情绪三个心理健康维度的影响,以及自然联结在其中的作用,调查了911名北京市居民,并构建了结构方程模型。分析结果表明,城市公园的感知要素可以直接促进居民的正向情绪和认知功能,也可以通过自然联结间接促进居民的正向情绪和认知功能,并缓解居民的心理症状和负向情绪。另外,城市公园的活动要素可以直接促进居民的正向情绪,缓解居民的心理症状和负向情绪。然而,自然要素和休息要素对居民心理健康各维度的预测作用不显著。因此,应注重增加城市公园中的感知要素和活动要素,以及增强人与自然的互动,提高居民与自然的联结。

关键词: 城市公园; 环境要素; 自然联结; 心理健康

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The Influence of Environmental Elements in Urban Parks on Residents' Mental Health

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Abstract: To investigate the influence of the natural, perceptual, rest, and activity elements in urban parks on residents' three mental health dimensions (i.e., positive emotions, cognitive function, and psychological symptoms and negative emotions), and the role of nature connectedness in this context, the current study surveyed 911 Beijing residents and constructed a structural equation model. The results showed that the perceptual elements in urban parks could directly promote residents' positive emotions and cognitive function, and could also indirectly promote residents' positive emotions and cognitive function and alleviate psychological symptoms and negative emotions through nature connectedness. In addition, the activity elements in urban parks could directly promote residents' positive emotions as well as alleviate psychological symptoms and negative emotions. However, the natural and rest elements were not significant predictors for all the dimensions of residents' mental health. Therefore, emphasis should be placed on increasing the perceptual and activity elements in urban parks, as well as on enhancing human-nature interaction to improve the nature connectedness of residents.

Key words: urban parks; environmental elements; nature connectedness; mental health

一、研究回顾

经济的持续增长和社会竞争的加剧促使居民的

工作和生活节奏逐渐加快,由此引发的各类心理问题逐渐成为影响经济发展和社会稳定的重要公共卫生问题。在“健康中国”战略部署以及健康城市建设

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的背景下,城市公园在促进居民心理健康中的作用成为风景园林、公共健康和环境心理学等学科关注的重点内容,并证明了城市公园中单一环境要素或多环境要素能够提升居民的心理健康^[1-3]。然而,心理健康是一个多维度的概念,具体表现涵盖了积极指标和消极指标等^[4-5],城市公园的不同环境要素在居民心理健康不同维度上发挥的恢复性作用是否存在差异尚待进一步明确。另外,随着人与自然关系理论的发展,自然联结这一反映人们感知到的自身与自然亲密关系的概念被越来越多的研究者关注^[6-7],且已有研究发现,自然环境可以通过个体的自然联结影响心理健康^[8-9]。然而,城市公园中的何种环境要素能够增强居民的自然联结进而提升心理健康的何种维度也有待进一步探讨。

(一) 城市公园环境要素和心理健康

城市公园的环境要素大致可分为自然景观要素、环境感知要素和基础设施要素^[1]。已往研究基于注意力恢复理论和压力缓解理论证明了城市公园的环境要素能够对居民的心理健康产生恢复性效果^[1, 10]。自然景观要素包括动植物、水体和地形等,研究表明城市公园中的植被指数、水体指数、生物多样性和地形起伏等状况会影响居民的心理健康水平^[1, 11-12]。环境感知要素是居民对公园环境的主观感受,城市公园的安全感、吸引力和平静安逸等主观感知有助于提高居民的心理健康^[1, 13]。基础设施要素包括活动设施和休息设施,城市公园活动设施的数量和种类,以及休息设施的数量、舒适性和朝向等对居民心理健康具有一定的促进作用^[1, 14]。在心理学领域,心理健康被分为多个维度。例如,心理健康双因素模型把心理健康分为积极和消极两个维度^[4],也有研究把心理健康分为正向情绪、认知功能以及心理症状和负向情绪三个维度^[5],不同维度间是相互独立的。例如,当正向情绪出现时,负向情绪也可能被体验到;反之,当负向情绪强烈时,正向情绪也可以存在。已有研究以居民生活街道为研究对象,证实了街道环境在影响居民心理健康的积极和消极维度时存在路径的独立性^[15],因此,城市公园的环境要素在促进居民心理健康不同维度中所发挥的作用可能存在差异。

(二) 自然联结的中介作用

自然联结是自然环境对人们产生影响的重要心理机制之一,能够反映人们和自然之间存在的亲密关系^[6-7]。在情感方面,人们对自然产生依恋;在认知方面,人们感知到自我与自然融为一体;在身体体验方面,人们感受到自然的魅力,被自然吸引。基于生态系统理论,个体的发展受到环环相扣的嵌套

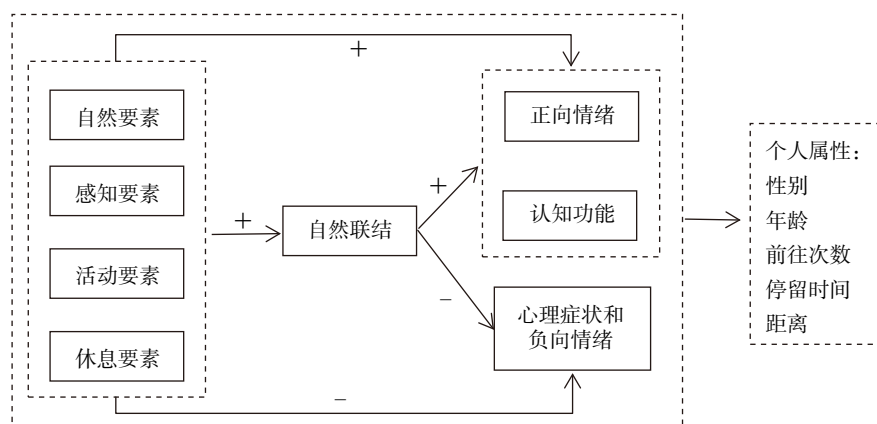
环境的影响,远端环境因素可以通过近端个体因素影响发展结果^[16]。因此,城市公园中的环境要素作为远端环境也许能够通过自然联结这一近端个体因素影响居民的心理健康。已有研究证明了个体的自然体验通过促进自然联结进而提高居民的心理健康水平^[8-9],然而,城市公园中的何种环境要素能够增强居民的自然联结进而提升心理健康的何种维度尚不明确。

二、假设模型

城市公园涉及的环境要素众多,本文参考彭慧蕴^[1]对公园环境要素的分类,将城市公园的环境要素分为自然要素、感知要素、休息要素和活动要素。自然要素包括城市公园中植物的种类、水景观赏性以及地形起伏等;感知要素包括城市公园对居民有吸引力,能够提供安全、卫生及安静等方面的主观感受;休息要素包括城市公园内休息设施的数量、舒适性以及朝向等;活动要素包括城市公园内娱乐健身活动设施的数量及种类等。由于以个体对客观环境的感知和评价作为研究对象能更好地解释客观环境促进个体身心健康的内在机制^[17-18],因此本研究参考已往文献^[1, 15],采用居民自我报告的方式测量城市公园环境要素的特点。

本研究采用了单维度的自然联结量表^[6]来衡量自然联结的强度。在评估居民的心理健康水平时,本研究参考了许军等^[5]编制的问卷,将居民的心理健康分为正向情绪、认知功能,以及心理症状和负向情绪三个维度。正向情绪是当个体的需求被满足之后产生的积极情绪体验;认知功能是指人脑加工、储存和提取外界信息的能力;心理症状和负向情绪是个体受内在环境或外在环境影响而感受到心情低落和不愉快时产生的各种负面体验,以及长期处于此状态下心理活动异常的表现。另外,根据已往研究,城市公园环境对居民心理健康的促进作用可能会受到其他因素的影响,包括居民的性别、年龄、前往次数、停留时间,以及与城市公园的距离等^[19-21],因此,本研究将其作为控制因素。

城市公园环境要素影响居民心理健康的假设模型见图1,具体的研究假设如下。H1:城市公园的各环境要素显著促进居民的心理健康(直接效应假设)。其中,H1a:城市公园的各环境要素正向预测居民的正向情绪和认知功能;H1b:城市公园的各环境要素负向预测居民的心理症状和负向情绪。H2:城市公园的各环境要素通过自然联结对居民的心理健康产生影响(间接效应假设)。其中,H2a:城市公园的各环境要素通过提高居民的自然联结水平进而正



注:“+”表示正相关关系,“-”表示负相关关系

图1 城市公园环境要素影响居民心理健康的假设模型

向预测居民的正向情绪和认知功能; H2b: 城市公园的各环境要素通过提高居民的自然联结水平进而负向预测居民的心理症状和负向情绪。

三、研究设计

(一) 数据来源

本文以北京市年龄在18岁及以上且每周至少前往城市公园1次的居民为研究对象。通过问卷星平台对居民进行随机抽样调查,调查时间为2022年9月—10月,调查共发放问卷930份。剔除作答不完整、题项选择完全一致,以及前后作答相互矛盾的问卷后,最终得到有效数据911份,有效回收率为97.96%。其中,男性283人,女性628人,年龄范围为18~55岁(平均年龄为34.66岁,标准差为10.11岁)。

(二) 问卷情况

1. 受访者的社会学信息

主要包括性别(男、女)、年龄、每周前往城市公园的次数(1~2次、3~4次和5次及以上)、每次在城市公园停留的时间(15 min之内、16~30 min、31~60 min、61~90 min和91 min及以上),以及与城市公园的距离(2 km以内、2~3 km、4~5 km和6 km及以上)。“城市公园”为受访者最常去的公园。

2. 城市公园环境要素

参考彭慧蕴^[1]编制的《社区公园恢复性环境特点》量表,将城市公园的环境要素分为自然要素(如植物种类丰富)、感知要素(如空间氛围安静)、活动要素(如娱乐健身设施种类丰富)和休息要素(如休息设施数量充足)4个方面,共有13道题目。采用李克特5点计分,从1至5分别代表“非常不同意”到“非常同意”。得分越高表明城市公园的环境要素越丰富。

3. 自然联结

采用Schultz^[6]的《自然联结》量表,该量表只有

一道题目,为7对圆圈,每对圆圈中的一个圆圈代表“自然”,另一个圆圈代表“自我”,从第1对到第7对,两个圆圈重叠的部分越来越多,分别记1~7分。受访者的得分越高,表明自然联结程度越高。

4. 心理健康

采用许军等^[5]编制的《自测健康评定》量表中的《心理健康》子量表,共15道题,包括正向情绪(如您对未来乐观吗)、认知功能(如您容易集中精力去做一件事吗)、心理症状和负向情绪(如您感到坐立不安、心神不定吗)三个维度。采用李克特11点计分测量,从0至10分别代表“非常不乐观”到“非常乐观”。在正向情绪和认知功能维度上,得分越高表明心理健康水平越高。在心理症状和负向情绪维度上,得分越高表明心理健康水平越低。

(三) 数据分析方法

本文使用SPSS 26.0和MPLUS 8.0等软件分析数据。首先,使用SPSS 26.0对问卷数据进行信效度分析、共同方法偏差检验、正态分布检验以及描述性统计分析。其次,使用MPLUS 8.0检验假设模型的拟合优度。采用Bootstrap对样本进行5 000次抽取,结果效应值的95%置信区间不包含零则表示中介效应在 $p < 0.05$ 水平上的统计学意义显著^[22]。拟合过程中运用极大似然法进行参数估计。若 χ^2/df 介于0~3之间、相似性指标(比较拟合指数,简称CFI; Tucker-Lewis指数,简称TLI)大于0.90、差异性指标(均方根近似误差,简称RMSEA; 标准化均方残差,简称SRMR)低于0.08则表明模型具有较好的拟合优度^[23-24]。

四、研究结果

(一) 信效度检验

运用SPSS 26.0检验各量表的信效度,结果见表1、2。城市公园环境要素的总Cronbach's α 系数为0.94,各分维度的Cronbach's α 系数在0.80~

表 1 量表的信效度检验

量表	维度	测量指标	单项与 总和的相关性	标准化 因子负荷	平均方差提取量	各维度 Cronbach's α 系数	总体 Cronbach's α 系数
城市公园 环境要素	自然要素	植物种类丰富	0.85	0.77	0.54	0.80	0.94
		水景优美, 观赏性强	0.86	0.76			
		地形起伏, 有高差变化	0.83	0.66			
	感知要素	空间氛围安静	0.82	0.70	0.58	0.85	
		景观丰富有吸引力	0.85	0.83			
		空间有安全感	0.84	0.75			
		环境卫生好	0.81	0.75			
	休息要素	休息设施数量充足	0.90	0.81	0.67	0.89	
		休息设施舒适性好	0.92	0.83			
		休息设施的朝向景观好	0.90	0.82			
	活动要素	活动场地数量充足	0.86	0.81	0.65	0.90	
		娱乐健身设施种类丰富	0.94	0.80			
娱乐健身设施数量充足		0.94	0.80				
心理健康	正向情绪	乐观	0.84	0.79	0.60	0.89	0.90
		满意生活状况	0.86	0.82			
		信心	0.86	0.79			
		环境安全	0.77	0.72			
		幸福	0.82	0.74			
	认知功能	记忆力	0.79	0.77	0.59	0.73	
		处理问题的能力	0.82	0.84			
		精神集中	0.81	0.69			
	心理症状和负向情绪	精神紧张	0.69	0.65	0.50	0.86	
		情绪低落	0.74	0.72			
		无故害怕	0.75	0.69			
		反复确认	0.65	0.68			
		孤独	0.77	0.72			
		坐立不安	0.82	0.78			
		空虚无聊	0.78	0.69			

表 2 区分效度检验结果

量表	潜变量	均值	标准差	自然要素	感知要素	休息要素	活动要素	正向情绪	认知功能	心理症状和负向情绪
城市公园 环境要素	自然要素	3.75	0.69	0.73						
	感知要素	3.78	0.65	0.77	0.76					
	休息要素	3.69	0.74	0.66	0.76	0.82				
	活动要素	3.59	0.80	0.63	0.70	0.77	0.81			
心理健康	正向情绪	7.41	1.67	0.24	0.31	0.29	0.28	0.77		
	认知功能	6.73	1.53	0.20	0.24	0.20	0.20	0.51	0.71	
	心理症状和负向情绪	4.43	1.64	-0.12	-0.16	-0.11	-0.14	-0.54	-0.36	0.77

注: 对角线上的数字为对应变量的平均变异抽取量的算术平方根, 非对角线数字为变量间的相关系数, 所有相关系数均在0.01水平(双侧)上显著相关(双尾检验)。

0.90 之间。心理健康的总 Cronbach's α 系数为 0.90, 各分维度的 Cronbach's α 系数在 0.73 ~ 0.89 之间。表明本研究使用的量表具有较高的信度。

另外, 大部分测量指标的因子负荷高于 0.7。虽

然有小部分测量指标的因子负荷小于 0.7, 但均高于 0.65, 符合 Hair 等人提出的高于 0.5 的标准^[25]。所有维度的平均方差提取量在 0.50 ~ 0.67 之间, 均高于 0.5 的标准, 表明本研究的模型具有良好的收

敛效度。除了自然要素平均方差提取量的算术平方根小于感知要素,其他维度平均方差提取量的算术平方根均大于其本身与其他潜变量的相关系数,说明本研究的模型具有良好的判别效度。由此可见,本研究使用的量表具有较高的效度。

(二) 共同方法偏差检验

采用 Harman 单因素检验法对本研究中的 34 个题目进行因子分析,特征值大于 1 的共有 5 个因子,其中第一个公因子的方差解释百分比为 27.06%,小于 40% 的标准。根据周浩等的观点^[26],本研究中不存在明显的共同方法偏差。

(三) 正态分布检验

使用极大似然法对数据进行参数估计的必要前提是数据呈正态分布^[27]。使用 SPSS 26.0 对所有题目进行偏度和峰度检验,结果表明所有题目的偏度系数绝对值在 0~0.85 之间,峰度系数绝对值在 0.06~0.76 之间,均小于 2,因此本研究中的所有题目均呈正态分布。

(四) 描述性统计分析

研究样本中,71.90%、21.19% 和 6.91% 的受访者每周前往城市公园的次数分别为 1~2 次、3~4

次和 5 次及以上。17.45%、33.81%、22.72%、14.93% 和 11.09% 的受访者通常在城市公园中停留的时间分别为 15 min 之内、16~30 min、31~60 min、61~90 min 和 91min 及以上。38.53%、41.27%、14.05% 和 6.15% 的受访者与城市公园的距离分别为 2 km 以内、2~3 km、4~5 km 和 6 km 及以上。

(五) 假设检验

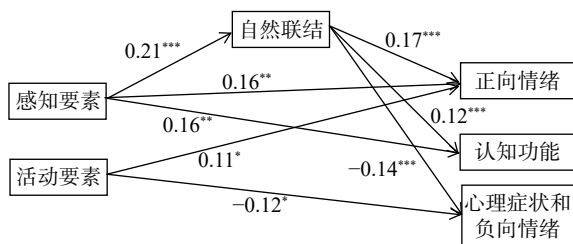
使用 MPLUS 8.0 软件对模型的拟合优度进行检验。结果表明模型的 $\chi^2/df=2.11$, CFI=0.97, TLI=0.95, SRMR=0.03, RMSEA=0.04。因此,本研究中的模型具有较好的拟合优度。

具体结果见表 3 和图 2。城市公园环境的感知要素显著促进居民的自然联结($\beta=0.21, p<0.001$)、正向情绪($\beta=0.16, p<0.01$)和认知功能($\beta=0.16, p<0.01$);活动要素显著促进居民的正向情绪($\beta=0.11, p<0.05$),并缓解心理症状和负向情绪($\beta=-0.12, p<0.05$);自然联结显著促进居民的正向情绪($\beta=0.17, p<0.001$)和认知功能($\beta=0.12, p<0.001$),以及缓解心理症状和负向情绪($\beta=-0.14, p<0.001$)。本模型中的其他路径未达到显著性水平。

另外,自然联结在感知要素和心理健康各维度

表 3 模型标准路径回归系数

路径关系	标准化系数	标准误	Z值	显著性	95%置信区间
自然要素→自然联结	-0.02	0.05	-0.42	> 0.05	[-0.12, 0.08]
感知要素→自然联结	0.21	0.06	3.59	< 0.001	[0.09, 0.32]
休息要素→自然联结	-0.05	0.06	-0.90	> 0.05	[-0.17, 0.06]
活动要素→自然联结	0.01	0.06	0.26	> 0.05	[-0.09, 0.02]
自然要素→正向情绪	-0.03	0.05	-0.62	> 0.05	[-0.12, 0.07]
自然要素→认知功能	0.02	0.05	0.41	> 0.05	[-0.08, 0.13]
自然要素→心理症状和负向情绪	0.02	0.05	0.30	> 0.05	[-0.09, 0.12]
感知要素→正向情绪	0.16	0.06	2.95	< 0.01	[0.05, 0.27]
感知要素→认知功能	0.16	0.05	2.97	< 0.01	[0.05, 0.26]
感知要素→心理症状和负向情绪	-0.10	0.06	-1.74	> 0.05	[-0.21, 0.01]
休息要素→正向情绪	0.08	10.06	1.45	> 0.05	[-0.03, 0.19]
休息要素→认知功能	0.01	0.06	0.12	> 0.05	[-0.11, 0.13]
休息要素→心理症状和负向情绪	0.05	0.05	0.96	> 0.05	[-0.06, 0.16]
活动要素→正向情绪	0.11	0.05	2.25	< 0.05	[0.01, 0.21]
活动要素→认知功能	0.06	0.05	1.14	> 0.05	[-0.05, 0.16]
活动要素→心理症状和负向情绪	-0.12	0.05	-2.17	< 0.05	[-0.22, -0.01]
自然联结→正向情绪	0.17	0.03	5.31	< 0.001	[0.11, 0.24]
自然联结→认知功能	0.12	0.03	3.53	< 0.001	[0.05, 0.18]
自然联结→心理症状和负向情绪	-0.14	0.03	-4.39	< 0.001	[-0.21, -0.08]



注: *表示 $p < 0.05$, **表示 $p < 0.01$, ***表示 $p < 0.001$ 。

图2 城市公园环境要素影响居民心理健康的路径

之间具有显著的中介效应。感知要素显著促进居民的自然联结,进而提高居民的正向情绪和认知功能,以及缓解居民的心理症状和负向情绪,自然联结的中介效应量分别为0.04、0.03和-0.03,中介效应占总效应的比值分别为20%、15.79%和23.08%。其中,自然联结在感知要素、正向情绪及认知功能间具有部分中介作用,自然联结在感知要素、心理症状和负向情绪间具有完全中介作用。

为了更加简洁明了地展示结果,图2只展示了结果显著的路径,且本模型中的控制因素(受访者的性别、年龄、每周前往城市公园的次数、每次在城市公园的停留时间及与城市公园的距离)没有被描绘出来。路径值是标准化的回归系数(标准误差)。

五、分析与讨论

在“健康中国”的战略部署以及健康城市建设的背景下,本研究探讨了城市公园中的自然要素、感知要素、休息要素和活动要素对居民心理健康三个维度(正向情绪、认知功能、心理症状和负向情绪)的影响,及自然联结在其中的作用。结果表明,在控制了居民的性别、年龄、每周前往城市公园的次数、停留时间及与城市公园的距离后,感知要素可以直接正向预测居民的正向情绪和认知功能,也可以通过自然联结正向预测居民的正向情绪、认知功能以及负向预测居民的心理症状和负向情绪。另外,城市公园的活动要素可以正向预测居民的正向情绪,以及负向预测居民的心理症状和负向情绪。然而,自然因素和休息因素对居民心理健康各维度的预测作用不显著。

首先,感知要素可以显著正向预测居民的正向情绪和认知功能,然而未显著预测居民的心理症状和负向情绪,这与研究假设部分一致。城市公园中的感知要素能够为居民提供具有吸引力、安静、安全且卫生的自然环境,居民置身其中,感受到宁静和放松,从而提高正向情绪。另外,根据注意力恢复理论^[10],良好的自然环境会吸引个体的无意注意,使有意注意资源逐渐得到恢复,并且积极思考,从而提高认知功能。然而,心理症状和负向情绪的形

成可能受到个体特质、观念和期望,以及社会环境等多方面的影响^[28-29],因此,城市公园中的感知要素可能需要更复杂的路径以缓解居民的心理症状和负向情绪。

其次,感知要素可以通过自然联结正向预测居民的正向情绪和认知功能,并负向预测居民的心理症状和负向情绪,与研究假设一致。该结果可以解释为感知要素能够促使个体感受到自然的吸引力,感受到自然与自我融为一体,产生亲密关系和情感依恋,获得心理支持,从而对心理健康的各维度产生积极效应。另外,根据社会心理学中的移情现象^[30],人类与人类之间以及人类与自然环境之间产生的情感是相似的,自然联结可以帮助个体发展与他人的亲密关系与情感依恋,有助于个体获得更多的社会支持,从而对心理健康的各维度产生积极效应^[31]。同时,研究结果也表明感知要素通过自然联结预测居民心理健康各维度的效应量较小,这可能是因为心理健康在一定程度上是个体社会化的产物,是社会适应的表现,受社会因素的影响较大,受自然环境因素的影响较小^[32]。但是,即使效应量较小,也达到了显著水平,表明自然环境在促进居民心理健康中发挥着重要作用。

再次,城市公园的活动要素可以正向预测居民的正向情绪,以及负向预测居民的心理症状和负向情绪,这与研究假设部分一致。这一结果可能是因为体育活动具有宣泄功能,可以释放压力,促进个体身心愉悦。另外,个体的情绪与神经水平和皮层下某些组织的激活程度有关。已有研究证明,相较于体育活动前,被试前额不对称性在体育活动后有明显增加,表明体育活动具有调节情绪的作用^[33]。然而,本研究未发现城市公园中的活动要素在预测居民认知功能方面的显著作用。这可能是因为相较于正向情绪以及心理症状和负向情绪,认知功能涉及到更高水平或更复杂的恢复路径,城市公园的活动要素对认知功能的恢复作用相对较弱。

最后,自然因素和休息因素对居民心理健康各维度的预测作用不显著。在自然要素方面,可能是因为本研究中调查的是居民日常生活中最常去的城市公园,居民对公园中的自然要素“习以为常”,导致感受性降低,引发自然联结和恢复心理健康的效用减弱。在休息要素方面,城市公园的休息设施对居民尤其是老年人是必要的。然而,大多数居民在工作和生活中处于久坐状态,希望在城市公园中适当运动以及接触自然,因此,休息要素可能在恢复居民心理健康中发挥的作用较小。

本文具有理论和实践两方面的意义。在理论意

义方面,本研究基于生态系统理论所构建的模型及相关结论,丰富和拓展了城市公园社会效益相关领域的研究,尤其是在心理健康的恢复性效果及其机制方面具有一定的价值。首先,在研究视角方面,本文结合影响个体心理健康的远端环境和近端个体因素构建了理论模型,从微观视角拓展了城市公园的社会效益研究,有益于城市公园人地关系的理论探索。其次,在研究内容方面,本文将城市公园的环境要素和心理健康划分为不同维度,具体探讨了城市公园各要素在促进心理健康各维度中所表现出的差异。研究结果为城市公园促进居民心理健康的影响机制提供了一种更加微观的解释和研究证据,有助于从理论上推进城市公园环境要素的研究,拓宽了城市居民心理健康的影响机制探索。在实践意义方面,本研究对城市公园的高质量发展具有一定的启示意义。首先,城市公园设计应注重增加感知要素,为居民提供氛围安静、有吸引力、安全感高及卫生条件好的城市公园环境,使居民在其中能够感受到舒适、安宁和平静。其次,城市公园设计应注重增加活动要素,为居民提供活动场地,并依托公园环境创新居民的活动方式,提高活动的趣味性与多样性。最后,居民从进入城市公园到促进心理健康是一个渐进式的过程,在城市公园的设计中,应注重人与自然的互动,增加丰富多样的沉浸式体验形式,促进居民产生对自然的亲密和依恋,提高自然联结。

虽然本研究分析了城市公园各环境要素对居民心理健康各维度的恢复作用,但仍存在局限性。首先,由于已往研究表明以个体对客观环境的主观感知和评价为研究对象,能更好地解释客观环境促进个体身心健康的内在机制^[17-18],因此,本研究采用居民自我报告的方式测量城市公园的环境要素特点。但是,这种方式导致研究中涉及的公园较多,未来研究可以聚焦某一个或几个公园进行分析,为城市公园建设提供更具有针对性的建议。其次,本研究所使用的调查方法为问卷法,研究结果可能受社会期许影响产生偏差,未来研究可以结合访谈法等对本研究的结果做进一步验证。最后,本研究使用的是横向研究设计,未对研究对象进行持续关注,未来可进一步考虑使用纵向追踪设计,探讨城市公园环境要素与居民心理健康状态之间的动态关系。

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父母冲突与青少年心理健康的关系： 家庭复原力和心理安全感的链式中介作用

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【摘要】 目的:探讨父母冲突与青少年心理健康的关系以及家庭复原力与心理安全感在其中的链式中介作用。**方法:**采用父母冲突量表、家庭复原力问卷、安全感量表、DASS-21 抑郁分量表、主观幸福感量表对 777 名青少年进行调查。**结果:**(1)父母冲突对青少年抑郁和主观幸福感的直接效应显著;(2)父母冲突可通过心理安全感的单独中介以及家庭复原力和心理安全感的链式中介影响青少年抑郁;(3)父母冲突可通过家庭复原力和心理安全感的单独中介以及二者的链式中介影响青少年主观幸福感。**结论:**家庭复原力和心理安全感在父母冲突与青少年的心理健康之间起链式中介作用。

【关键词】 父母冲突; 家庭复原力; 心理安全感; 抑郁; 主观幸福感

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Relationship between Interparental Conflict and Mental Health of Adolescents: the Serial Mediating Role of Family Resilience and Psychological Security

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【Abstract】 Objective: To explore the relationship between interparental conflict and mental health and the serial mediating role of family resilience and psychological security in it. **Methods:** The Interparental Conflict Scale, Family Resilience Questionnaire, Sense of Security Scale, DASS-21 depression subscale, and Subjective Well-being Scale were used to investigate 777 adolescents. **Results:** (1) The direct effects of interparental conflict on adolescents' depression and subjective well-being were significant; (2) Interparental conflict affected adolescents' depression through the separate mediation of psychological security as well as the serial mediation of family resilience and psychological security; (3) Interparental conflict had an impact on the subjective well-being of adolescents through the individual mediations of family resilience and psychological security, as well as through the combined sequential mediations of both factors. **Conclusion:** Family resilience and psychological security function as serial mediators between interparental conflict and adolescents' mental health.

【Key words】 Interparental conflict; Family resilience; Psychological security; Depression; Subjective well-being

家庭是影响孩子发展最重要和直接的环境之一^[1]。中国传统文化强调家庭对人的重要性,并高度重视家庭的合作与和谐^[2]。然而,父母之间的冲突在每个家庭中都是常见且不可避免的^[3]。父母冲突是父母间由于分歧或其他因素引发的言语或肢体冲突,常用冲突的次数、强弱以及最终冲突是否得到解决来评估^[4]。越来越多的研究表明,父母冲突对青少年的身心健康存在诸多不利影响,包括增加青少年出现内化问题(如抑郁、焦虑)^[5,6]、外化问题(如违纪和攻击)^[7],以及适应问题(如社交回避)^[8]的概率。

心理健康双因素模型指出,对个体心理健康的评估应同时包含积极和消极两种指标^[9],因此本研究

将主观幸福感作为积极指标,将抑郁作为消极指标对青少年的心理健康进行评估^[10],并将二者作为青少年经历父母冲突的结果变量,关注父母冲突与青少年抑郁、主观幸福感之间的关系及内部机制。有研究发现,在父母冲突水平较高的日子里,青少年经历了更多的威胁和自责,同时主观幸福感减弱^[11]。反之,一项追踪研究发现,在父母关系良好的家庭中,青少年有更高的生活满意度和主观幸福感体验^[12]。因此,本研究提出假设 1a:父母冲突负向预测青少年主观幸福感;1b:父母冲突正向预测青少年抑郁。

家庭复原力是家庭能够抵御生活中的逆境与压力,并且在逆境中恢复和成长的能力^[13]。现有研究多考察个体复原力在父母冲突与青少年心理健康关系中的作用^[14],较少从家庭复原力的层面进行探讨。且家庭复原力的研究多关注患病家庭,如自闭症家庭^[15]、癌症家庭^[16]等。因此,本研究选取健康青

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少年为被试,从家庭层面出发,探索父母冲突通过家庭复原力对青少年心理健康的影响。

虽然目前没有直接研究考察父母冲突与家庭复原力的相关性,但已有研究发现,父母冲突与家庭复原力的诸多要素存在显著负相关,例如家庭凝聚力、亲密性^[17]。夫妻关系对家庭凝聚力、开放的情感交流的直接影响较大,良好的夫妻关系可以降低生活压力对家庭复原力的负面影响^[18]。还有研究发现,父母冲突会威胁家庭凝聚力和亲密性,增加青少年罹患抑郁症的风险^[17]。根据家庭调整与适应反应模型,家庭复原力水平越高的家庭,对危机的调整 and 适应能力越强,表现为家庭成员负面反应的减少和主观幸福感的增加^[19]。家庭复原力能够缓冲家庭压力对青少年心理健康的影响,降低压力事件下青少年的抑郁水平^[20]。反之,复原力越低的家庭在面对困境时,家庭成员可能出现更多消极情绪,幸福感体验也更低^[21]。因此,本研究提出假设2:家庭复原力在父母冲突与青少年主观幸福感、抑郁之间均起中介作用。

心理安全感是指个体对可能出现的危险或风险的预感,以及能否有效应对的感觉,主要由确定感和可控制感组成^[22]。精神分析理论强调了家庭关系对儿童心理发展的重要性,认为儿童安全感的主要影响因素是家庭环境和父母性格,如果家庭不和睦或家庭破裂,儿童会产生焦虑,从而无法得到满足和安全^[23]。不只是儿童,心理安全感作为心理健康的基础,对青少年的身心发展同样至关重要^[24]。现有研究也表明父母冲突对青少年安全感存在负面影响^[14, 25]。研究发现,缺乏安全感是预测抑郁症状的有效指标^[24],心理安全感水平越低,青少年的抑郁症状越严重^[25],幸福感体验越少^[26]。据此,本研究提出假设3a:心理安全感是父母冲突和青少年主观幸福感之间的中介,父母冲突通过破坏青少年心理安全感,进而降低其主观幸福感水平;3b:心理安全感在父母冲突和青少年抑郁之间起中介作用。

Walsh的家庭复原力模型^[13]指出,家庭成员间的负面交流(如争执与冲突),会损害家庭复原力中的家庭沟通过程,从而降低个体感知的家庭复原力水平,家庭成员的心理健康也会随之受到影响。在家庭复原力与心理安全感的关系上,个体感知的家庭复原力与心理安全感呈正相关^[27]。家庭凝聚力越低,青少年在生活中体验到的压力感越强,心理安全感水平也越低^[28]。由此,本研究提出假设4:家庭复

原力和心理安全感在父母冲突与青少年主观幸福感和抑郁之间均起链式中介作用。

综上,本研究旨在探讨父母冲突对青少年心理健康的影响,以及家庭复原力、心理安全感在其中的作用机制。

1 对象和方法

1.1 研究对象

采用方便抽样法从湖南省、四川省2所中学抽取被试,发放842份问卷,剔除重复作答、规律作答的问卷后,保留有效问卷777份,有效率为92.28%。被试年龄范围为11~16岁($M=12.83$, $SD=0.71$)。其中男生390名,女生387名;初一学生508名,初二学生266名,初三学生3名;父亲年龄范围29~59岁($M=41.62$, $SD=5.54$),母亲年龄范围29~59岁($M=39.46$, $SD=5.41$)。

1.2 研究工具

1.2.1 父母冲突 采用“中国儿童青少年心理发育特征”项目组编制的父母冲突量表^[29]。共有10个题项,包括冲突频率和冲突强度2个维度。采用5点计分,总分越高表明父母冲突越频繁、越强烈。本研究中,该量表的内部一致性系数为0.91。

1.2.2 家庭复原力 采用卜彤和刘惠军编制的家庭复原力问卷^[30]。共计20个题项,包括坚毅性、和睦性、开放性、支持性、共同度五个维度,采用李克特5点计分,得分越高表示个体感知的家庭复原力水平越高。本研究中,该量表的Cronbach's α 系数为0.96。

1.2.3 心理安全感 采用丛中、安莉娟编制的安全感量表^[22]。共16个题项,分为人际安全感和确定控制感两个维度。采用5点计分,总分越高,表明个体的安全感水平越高。本研究中,该量表的内部一致性系数为0.95。

1.2.4 抑郁 采用中文修订的抑郁-焦虑-压力量表^[31](Depression, Anxiety and Stress Scale-21, DASS-21)中的抑郁分量表。共计7个题项,采用4点计分,总分越高表示个体的抑郁程度越严重。该量表已被证明适用于青少年群体^[32]。本研究中,该量表的内部一致性系数为0.84。

1.2.5 主观幸福感 采用Campbell编制、“中国儿童青少年心理发育特征”项目组修订的儿童青少年主观幸福感量表^[29]。量表共有9个项目,包括总体情感指数和生活满意度两个维度。采取7点计分,

总分越高,表示个体感知到的幸福水平越高。本研究中,该量表的内部一致性系数为0.96。

1.3 统计方法

使用SPSS 25.0进行描述性分析、相关分析等。使用Mplus 8.3构建结构方程模型对家庭复原力和心理安全感的中介效应进行检验。

2 结 果

2.1 共同方法偏差检验

采取Harman单因子方法进行检验^[33],结果发现特征值大于1的因子有8个,最大因子的变异解释率为36.48%,未超过40%,因此认为本研究不存在严重的共同方法偏差。

2.2 描述性统计和相关分析

由表1可知,青少年的父母冲突、家庭复原力、心理安全感、抑郁以及主观幸福感两两之间显著相关。

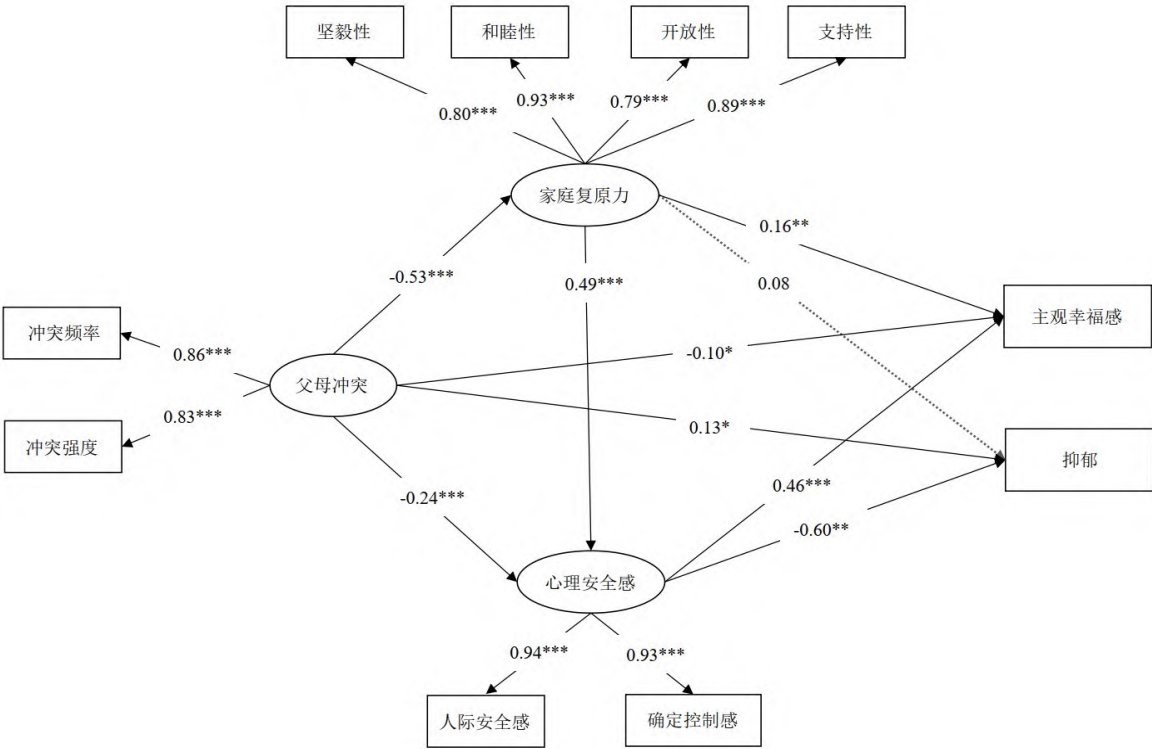
2.3 家庭复原力和心理安全感的链式中介作用检验

依据假设,以父母冲突为自变量,家庭复原力和心理安全感依次为中介变量,抑郁、主观幸福感为因变量,性别、年龄为控制变量,构建链式中介模型。模型拟合指标如下: $\chi^2/df=2.61$,RMSEA=0.05,CFI=0.99,TLI=0.98,SRMR=0.04。结果显示(见图1):人口学变量性别、年龄对抑郁和主观幸福感的预测作用均不显著;父母冲突显著负向预测家庭复原力($\beta=-0.53$, $P<0.001$)、心理安全感($\beta=-0.24$, $P<0.001$)和主观幸福感($\beta=-0.10$, $P<0.05$);家庭复原力显著正向预测心理安全感($\beta=0.49$, $P<0.001$)和主观幸福感($\beta=0.16$, $P<0.01$);心理安全感显著正向预测主观幸福感($\beta=0.46$, $P<0.01$),显著负向预测抑郁($\beta=-0.60$, $P<0.01$);家庭复原力对抑郁的预测不显著($\beta=0.08$, $P=0.23$)。

表1 各变量的描述性统计分析

变量	平均值	标准差	1	2	3	4	5
1 父母冲突	17.36	6.69	1				
2 家庭复原力	77.62	16.16	-0.45***	1			
3 心理安全感	61.87	12.97	-0.44***	0.57***	1		
4 抑郁	9.16	3.02	0.36***	-0.34***	-0.60***	1	
5 主观幸福感	12.51	2.63	-0.38***	0.47***	0.59***	-0.53***	1

注:*** $P<0.001$ 。



注:图中各系数均为标准化结果;* $P<0.05$,** $P<0.01$,*** $P<0.001$ 。

图1 链式中介模型结果

采用基于Bootstrap的中介效应检验(重复取样5000次),结果显示(见表2):父母冲突对抑郁的总效应为0.37($P<0.001$),直接效应为0.13($P<0.05$),总间接效应为0.25($P<0.001$);父母冲突对主观幸福感的总效应为-0.35($P<0.001$),直接效应为-0.10($P<$

0.05),总间接效应为-0.26($P<0.001$)。Bootstrap 95%置信区间均不包含0,说明模型的总效应、直接效应、总间接效应均显著。在间接效应检验结果中,除父母冲突→家庭复原力→抑郁路径的间接效应不显著之外,各路径的间接效应均显著。

表2 链式中介检验结果

	效应值	标准误	95%置信区间	效应量占比
父母冲突对抑郁的总效应	0.37***	0.05	0.28, 0.47	-
父母冲突对抑郁的直接效应	0.13*	0.05	0.01, 0.22	32.26%
父母冲突对抑郁的总间接效应	0.25***	0.04	0.18, 0.34	67.74%
父母冲突→家庭复原力→抑郁	-0.04	0.03	-0.10, 0.03	-
父母冲突→心理安全感→抑郁	0.14***	0.04	0.07, 0.22	37.10%
父母冲突→家庭复原力→心理安全感→抑郁	0.15***	0.03	0.11, 0.21	40.86%
父母冲突对主观幸福感的总效应	-0.35***	0.04	-0.42, -0.28	-
父母冲突对主观幸福感的直接效应	-0.10*	0.05	-0.17, -0.01	24.71%
父母冲突对主观幸福感的总间接效应	-0.26***	0.04	-0.33, -0.19	75.29%
父母冲突→家庭复原力→主观幸福感	-0.07**	0.02	-0.12, -0.03	20.40%
父母冲突→心理安全感→主观幸福感	-0.09**	0.03	-0.15, -0.05	26.15%
父母冲突→家庭复原力→心理安全感→主观幸福感	-0.10***	0.02	-0.14, -0.07	28.74%

注:* $P<0.05$,** $P<0.01$,*** $P<0.001$ 。

3 讨 论

本研究中,父母冲突显著正向预测青少年的抑郁水平,负向预测主观幸福感水平,这与以往研究结果类似^[34,35],支持了研究假设1a、1b。父母关系是家庭关系中至关重要的部分,父母关系的不和谐会营造出压抑、紧张的家庭氛围,对孩子心理健康造成不利影响^[21]。溢出理论也指出,时常出现冲突的父母可能会忽视对孩子的教养,或将孩子作为宣泄对象,这些情况都有可能损害孩子的心理健康^[36]。父母冲突已被证明是孩子家庭压力的主要来源之一^[21],严重的父母冲突可能导致孩子在家庭中感受到更多压力,主观幸福感下降,抑郁情绪增加^[35,37]。此外,父母稳定的关系是青少年生活的有力保障,因此青少年对父母之间的冲突更为敏感,也更易受到负面影响^[38]。

本研究发现,家庭复原力在父母冲突与青少年主观幸福感之间起部分中介作用,结果部分验证了研究假设2。依据Walsh的家庭复原力理论^[13],父母冲突中通常伴随着对立、争吵和指责,破坏了家庭复原力中的沟通和问题解决的过程,损害家庭的和谐沟通,从而影响青少年对于整体家庭复原力的感知。从家庭凝聚力的角度来看,在危机时期,家庭的团结和相互支持被认为是家庭复原力中最重要的恢复因素之一^[39],父母冲突破坏了家庭整体的团结和统一,危害家庭凝聚力,导致家庭成员感知的家庭复原力减少。复原力较低家庭中的青少年感受到来自

家庭的支持较少,体验到的幸福感自然也会减少。但是,本研究并未发现家庭复原力对青少年抑郁的直接预测作用,这与本研究假设2不符。可能的解释是,家庭复原力作为家庭层面的因素可能要通过影响青少年的个体素质,即降低其心理安全感,才能进一步影响其抑郁水平。

本研究中,心理安全感在父母冲突与抑郁、主观幸福感之间起部分中介作用,支持假设3a、3b,与以往研究结果相似^[14,40]。一方面,父母冲突是引发青少年不安全感(如痛苦、回避、消极表征)的重要因素,当青少年对父母关系的内在表征受到威胁时,他们的心理安全感可能遭到破坏^[41]。如果父母关系长期紧张,青少年的安全感水平将受到负面影响^[42]。另一方面,内部和外部环境的安全以及由此产生的安全感对于个体的心理健康至关重要^[43]。在安全的环境中,个体能充分发挥自己的潜能,创造更多的物质和精神财富,从而体验所获得的幸福,减少抑郁情绪的产生^[44]。然而,父母冲突破坏了家庭环境的安全,降低了青少年的心理安全感,可能影响其各种能力的发挥,进一步破坏其心理健康。

本研究还发现,父母冲突可通过家庭复原力与心理安全感的链式中介影响青少年的心理健康,支持了研究假设4。父母冲突降低了青少年感知的家庭复原力水平。家庭可能被认为缺乏应对危机的能力。而家庭作为支持青少年成长最重要的主体,对其情绪和感受的产生和抑制有重要影响^[45]。因此,

青少年感知家庭应对危机能力缺失,可能影响其对自身应对危机的感知,使其产生面对危机的不自信感、不可控感^[27]。而且,Walsh的家庭复原力模型也指出,家庭复原力与个体对待逆境的态度有关^[46],复原力较低的家庭,成员难以形成战胜逆境的信念和乐观面对困难的态度。因此,青少年在生活中也更可能担忧自身没有足够的力量处理风险与压力,心理不安全感上升,心理健康水平也随之降低。本研究结果提示减少父母冲突,营造和谐的家庭环境,有助于增强家庭的复原力水平,提高青少年的心理安全感,进而促进青少年的心理健康。

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社会治理视阈下良好社会心态的培育

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【摘要】新冠肺炎疫情不断反复对民众社会心态造成了较大冲击，如何引导民众在疫情防控常态化中形成自尊自信、理性平和、积极向上的社会心态是当务之急。本文分析了疫情防控中我国民众的社会心态现状，疫情防控对社会心态的消极影响，对疫情防控中如何培育健康社会心态提出建议，为未来社会治理过程中民众良好积极的社会心态培育提供理论依据及政策建议。

【关键词】疫情防控 社会心态 社会心理服务体系

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近几年，国家将社会心理服务体系放在社会治理的板块中，并且着重强调其对培育健康社会心态的重要性。社会治理中的社会心理服务要求我们拓宽宣传引导渠道，将新时代我国社会全面发展所取得的成就多方位全面展示，用高效具体的行动来增强民众的社会信任及社会信心。社会心理服务要重视社会的作用，突破原本心理健康服务的局限性，从更加宏大的视角看待问题，着重解决社会性的心理问题。

社会心态的培育是社会心理服务的新方向，初始被看作是一种社会现象，关注人体与群体之间的相互影响^①。国内学术界认同度较为广泛的是社会心态由四点基本内容组成：社会情绪、社会认知、社会价值观、社会行为倾向，这些社会心态的基本内容均在社会成员的社会生活中体现^②。社会心态反应了人民群众本身的一种社会意识，它的形成和发展反映的是一种社会现实，影响到个体和群体的身心健康

和行为方式，甚至改变个体的价值观念从而影响其对国家或制度的信任及认识。

2019年12月，突如其来的新冠肺炎疫情开始在中国蔓延，此后的两年时间内国外疫情态势不断升级，国内疫情在严防把控的基础上呈现阶段性反复现象，严重威胁到民众身心健康。新冠肺炎疫情是对我国社会心理服务体系的一次重大考验，是一项比较典型的突发公共卫生紧急事件。新冠肺炎疫情从短时期的迅速蔓延发展到长时期的不断反复对人民群众的社会心态造成了巨大的冲击，面对重大疫情不断反复出现的情况，一般会产生群体焦虑、社会恐慌、人际关系恶化等消极社会心理，甚至引发社会动荡。疫情持续过程中社会心态的引导和培育有其基础性和必要性。国民的社会心态展现的是一种社会认知和社会价值观，积极平和、理性尊重的社会心态是我国经济向前不断发展的巨大推动力。国民良好的社会心态可保

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持经济结构的稳定性,利于国家构建公平公正的经济社会管理体制。

新冠肺炎疫情是目前全球性难题,国家提倡的社会心理服务原则上是为培育国民积极健康的社会心态,而究其本质可知社会心理服务必须要关注现实中不良的社会情绪和社会问题,在自身建设的基础上为社会管理及社会治理贡献力量。需要引导民众理性对待疫情防控的常态化,不要将不好的心理影响“泛化”到日常生活中,可有效制止社会心态的颓势发展,进而向良性循环靠拢。

一、疫情防控中民众社会心态现状

(一) 民众主体认知结构塑造环境不确定性及风险感知。当突如其来的疫情席卷整个社会的时候,社会应急响应的认知层面主要是对新冠肺炎疫情风险的认知。首先人们的社会认知会受到疫情的影响,谢金和周卓钊指出,人们所具备的社会认知决定了其产生的行为反应,并且人们的焦虑恐慌情绪随着疫情事件不确定性的增加而增大^③,不确定性是人们认知结构不断进行扩展的结果^④。最初风险的发生可能仅对个人生命安全造成威胁,民众会从“风险大小”“危险程度”“风险距离”三个方向衡量自己可能陷入风险的概率。有研究者调查结果显示,疫情初期湖北省内的民众认为自己非常可能感染新冠的比例为41.7%,非湖北省的民众比例为24%。湖北省民众在新冠肺炎治愈可能性上的认知摇摆不定,省外民众偏向于新冠肺炎很大可能性治愈^⑤。对疫情扩散可能性的感知全国都呈现逐渐下降的趋势,但湖北省随疫情波动感知风险有所回升。

经过两年的与疫情共存的社会环境的变化,人们对疫情的突然暴发与防控有了更多的了解与认识。信息是社会成员认知的依据,现代社会中人们对风险认知不足会引发焦虑,风险信息通过各类媒体的传播造就了“媒介化风

险”,现代人对风险的焦虑来自媒体。调查显示,疫情期间民众主要靠微信、微博等手机软件获取疫情信息;电视、网站、新闻客户端的信息相对影响较小^⑥。在这种情况下,社交媒体承担着实体到网络的信息传递、情绪渲染及社会心态引导作用。目前在疫情防控常态化的背景下,我国政府加强了主流媒体对疫情的科普与介绍,抗疫专家与一线人员及时召开相关新闻发布会,公开疫情信息,极大地减弱了信息闭塞及谣言对社会各方面的影响。

(二) 民众社会情绪彰显社会心理状态。情绪是生理唤醒和认知结合的产物^⑦。疫情在两年时间内反复发生,每次人们的社会情绪是首先被唤醒的,每当疫情在某地爆发,当地人们会产生较多的负面社会情绪,例如愤怒感、悲伤感、无助感、失望感等。新冠肺炎疫情作为灾难性事件让人产生创伤性应激反应,每个人身份不同状态也是不同的。亲人离世/非离世、自己感染/未感染、抢救者/救援者/普通民众、疫区/非疫区等各种不同身份的人们的应激状态有所差异。针对新冠疫情的一项调查研究发现:2020年2月底的时候,近三分之一的调查对象出现了一定程度的抑郁,22.4%的民众出现了较为明显的焦虑情绪,整体调查对象的抑郁水平普遍高于2008年的全国调查^⑧。突发公共卫生事件对人们社会心态的影响并不仅仅存在于当时事件发生的过程中,而是具有一定的延续性。学者指出,参与疫情救治的医护人员会在一段时间后依旧有较高的心理压力和创伤后应激反应^⑨。姜伟等人发现,经过两年时间的疫情防控,不同地区再经历疫情短暂暴发的事件,我国民众群体负面情绪的上升幅度显著下降,人们的愤怒等情绪空间分布的范围较小^⑩。这与国家严格管控措施及心理情感疏导有着密切的关系,疫情发生后对民众及医护人员长时间的社会情绪及社会心态的修复有其必要性及重要性。

疫情对民众社会情绪的危害不仅是普通大

众对自己健康产生的恐惧和担心,同时疫情会给不同的群体造成群体性的影响,增加民众不同类型的心理健康风险。疫情期间有报道表明:相比于年轻人,老年人感染新冠肺炎后更容易发展为重症病例^⑩,老年群体的社会心态会受到媒体报道与病情事实的影响,从而产生更多的担忧与焦虑。年龄是划分群体的一个因素,疫情防控常态化也使民众面对健康焦虑的同时面临较大的经济压力,不同的工作状态也是增加民众心理问题的重要因素。处于失业状态下的民众的抑郁接近抑郁倾向的警戒线,同时他们的焦虑程度也更高。2020年疫情袭来后的两年时间内,很多私营企业及个人经营者面临破产与倒闭的风险,不稳定的工作状态使得人们的情绪健康状况越来越糟糕。有研究者指出,在疫情期间仍然能继续在自己岗位上工作的人员抑郁和焦虑水平相对较低。其中,可能的原因包括两点:疫情期间仍可以开工的地方疫情的严重性可能并没有那么高,对人们心理和行为的影响相对较弱;能够保持工作的人不仅可以保持自己的经济来源同时可以维持个人意义感,在此基础上可缓解疫情对人们心理造成的创伤^⑪。

(三) 民众社会价值观代表个体精神文化及国家社会治理重要性。疫情防控下的社会心态反应了人民群众本身的一种社会意识,它的形成和发展反映的是一种社会现实,影响到个体和群体的身心健康和行为方式。消极的社会心态往往可能会影响人们改变个体价值观念,从而有可能对社会乃至国家的制度体系失去信心^⑫。疫情发生后,社会风险感知使得人们生产生活进入非常态化的境地,生活必需品及紧要物资的匮乏引起了一定的社会恐慌。同时有一些不良的商家秉持物质价值观至上的观点对紧俏物资坐地起价,这类行为蕴含的资源的不平等分配会引发一系列的不良社会影响。民众对人身安全、经济、社会稳定产生的不安全感使得焦虑和恐慌开始在社会上蔓延,但是这种不

良的社会心态可由民众的社会公正感和信任感缓解与减弱^⑬。社会民众对政府及公共机构的信任一方面依靠前期社会发展过程中的信任积累,另一方面依靠突发事件发生后国家与政府如何采取紧急行动确保民众的安全与基本利益。当疫情发生后,民众对政府的期待没有得到相应的满足,社会公共信任就会降低,从而引发社会风险事件。

当民众处于非常担忧与紧张的状态时,人们更倾向于简化自己的逻辑思维,用感性的价值取向来维护自身相关权利与利益^⑭。而当今社会网络无处不在,风险信息的“易”传播滋养了舆论与谣言的生长从而危害到社会稳定与安全。民众作为“虚拟网络公民”身份,在个人安全与利益无法保障的前提下更容易冲动发言与行动,甚至有些民众因疫情行动所限而沉溺于网络言语的制造与传播。民众持有“被扭曲”的价值观念看待疫情地区的人们,将疫区人们自动与病毒联系在一起,丧失理智作出一些过激行为。基于此,民众对国家与政府的信任及国家治理手段和方法凸显了自己的核心地位。

(四) 民众社会行为倾向及行为体现社会需求。重大疫情使人们失去了对生活的掌控感与安全感,会表现出一些不良行为:容易受惊坐立不安、改变饮食习惯、敌对他人和不愿与人交往等^⑮。疫情期间人们的社会行为还表现在一些疫情防控行为中,一项对初期疫情民众的防控行为调查显示:92.5%的民众出门戴口罩,94.0%的民众外出回家后洗手,97.3%的民众减少了外出次数,95.8%的民众选择不去人流较多的场所;对于过度防疫的行为大多数民众能够保持理性,不会采取过度的措施去寻求安全感;大多数民众对疫情保持正确的认识并且能够采取合理的行动,69.5%的民众取消了原有的异地探亲计划,74.7%的民众取消原有的旅游计划,77.5%的民众取消原有的聚餐计划。

通过两年的疫情常态化防控,能够看出我

国政府对疫情发生应对迅速,民众在保障自身安全的同时能尽最大努力帮助“疫区”应对困难。有研究者将疫情发生后民众的社会帮扶行为分为三类:自助、共助及公助行为。根据调查数据,疫情期间行动中“自助”行动的应急响应也出现了迟滞,但之后的整体效果非常好;自助行为主要是自己和家人针对疫情的防护。“共助”形式中出现的志愿者组织、社区组织、大型互联网平台都发挥了极大的作用。“公助”形式的公众满意度在疫情初期评价并不高,在疫情防控的一些方面被许多人认为存在不足。公助行动主要是由各级政府推动,由体制内部门和专业机构来完成的行动。这次疫情应急响应的主力是政府部门、医疗管理机构、公立医院的医护人员、疾控专家等^⑩。但是近两年的疫情常态化防控中,我国政府的公助取得了举国上下的一致好评,虽然在防控过程中有诸如管理不当的不足之处,但是疫情防控整体效果良好,将疫情影响控制在影响人民正常生活的最小范围内。有研究者指出,不同地区政府行为体现了政府治理能力的差异,中央政府需要利用不同地区疫情发生时当地的政府治理存在的问题,及时采取相应手段提升当地政府的疫情管控能力,保障民众的生活质量及社会的复工复产进程^⑪。

二、疫情防控中社会治理方式对社会心态的消极影响

疫情防控常态化中,我国政府采取了一些必要的强制性措施来抑制疫情的进一步恶化,保障民众的人身安全,维护社会的稳定发展。这些措施有利有弊,保障了民众安全的同时限制了民众的一些自由,保障了社会稳定的同时造成了国家巨大的经济损失,抑制了疫情恶化的同时滋生了民众的消极情绪。疫情防控常态化对民众社会心态产生的消极影响如下:

(一)“防微杜渐”宗旨隔离病毒同时阻碍

人们多方位缓解疫情压力。2020年1月开始,新冠肺炎疫情逐渐呈链式蔓延与传播。医学专家提出阻断疫情源头的建议,国家迅速采取了措施,对武汉实施“封城”,各地也明令禁止民众进行聚集性活动,提倡民众过年不聚会、不串门,不去各种娱乐场所增加交叉感染的风险。2021年年末,西安疫情暴发,又正值北京冬奥会的各项活动进行过程中,各地政府分别提倡过年期间非必要不返乡的引导指令,很多有本土疫情病例民众未能回家过年,民众或多或少产生了焦虑与忧伤的情绪。严格管控的指令和措施快速有效地制止了病毒的传播,在短时间内将疫情扩散的风险降到了最低。但是,由于严格的管控,紧张的社会氛围,人们的压力和情绪得不到放松缓解,逐渐产生了很多家庭、人际甚至省际间的矛盾。首先,一线医护人员及疫区民众每天处在病毒弥漫的空间内,承受着他人难以想象的压力,并且他们的活动范围更加有限,人际矛盾、医患矛盾等层出不穷;其次,由于短时间内应国家要求很多地方停工停学,大家都长时间地呆在家中,夫妻矛盾与亲子矛盾全面爆发,压力无从缓解,部分地区在疫情缓和后离婚率变高。疫情防控期间对病毒的严防死守没有错,但同时需要采取一些措施缓解民众的各方面压力,否则不利于社会心态的良好发展。

(二)“画地为牢”指令降低病毒传播风险但增强民众焦虑抑郁情绪。新冠肺炎疫情这场防控战中,社区等群体居所作为一个很小的单独的管理单位是重要的防疫环节。虽然社区在疫情期间强制隔离的手段和方法发挥了很重要的作用,但是社区的封锁和隔离给民众造成了心理上的恐慌和焦虑。尤其是居住在有疫情患者社区或周边小区的民众,对自身健康担忧的同时被限制在很小的活动范围中,人们的焦虑水平随时间的推移不断攀升,甚至与社区管理人员产生冲突。面对这样的情况,首先保障社区安全所实施的强制隔离手段是需要建立在合

法的基础上,社区不能随心所欲地封锁限制人们活动;其次,需要保障民众的基本权益,生活必需品的保障工作一定要到位。民众的社会情绪疏导非常重要,社区可派专业的社区工作人员利用微信等网络媒体平台与社区民众沟通,了解大家的困难和问题,及时解决民众产生的心理矛盾,降低不良社会情绪的产生。

(三)“包罗万象”网络信息谣言传播激发民众不良情绪。新闻媒体作为疫情信息的传播者,传播事实消息是其基本的职能。但是互联网是一个个体言论责任承担相对较低的场所,在疫情期间许多造谣者在疫情初期各方信息不够明朗的时期散播大量虚假负面的谣言,造成重大的社会和心理问题。当社会局势紧张时,不实的报道急速增长,而群众面对危机无法充分掌握真实信息则会产生恐慌的情绪,甚至做出有损道德的行为,使国家安全受到威胁,破坏社会心理环境,给国家、社会、政府、组织、个体带来消极影响。新闻媒体在国家社会面临威胁与危机的时候,需要秉持自己的基本功能,切断破除网络谣言的进一步扩散,将模糊不清、信息不全的消息进行核查与管控。必要时网络媒体可成为民众社会情绪安抚的重要途径与手段,成为社会舆论的引导者,指引民众社会心态朝积极向上的方向发展。

(四)“巧捷万端”大数据便民化同时忽视弱势群体的需求。让大数据成为疫情防控的“火眼金睛”固然是好事,便于疫情溯源和监测,可为遏制疫情扩散蔓延提供数据支撑。自健康码上线以来,时常有老年人因不会使用健康码出入不了公园景区、被公交车拒载等事件见诸网络,“扫码困难”群体以及相关事件也愈发受到舆论的关注。在人口数量上老年人已经成为一个城市相当重要的组成部分。根据国家统计局2020年1月17日公布的数据,2019年,我国60周岁及以上人口2.5亿,占总人口的18.1%,65周岁及以上人口1.8亿,占总人口的12.6%。我国老龄化程度不断加剧,据全国老

龄办预测,2030年,中国60岁及以上老年人口数量将达到3.7亿,占比25.3%。相关数据显示,我国60岁以上人口仅23%会上网。老年人作为我国庞大的一部分民众,在疫情期间无论是感染风险还是信息获取等都处于弱势,便利的现代化生活和防控措施需要考虑到弱势人群的需要,做到防控防疫不忘人文关怀。

三、疫情防控中利用社会治理手段引导培育民众积极社会心态

(一)信息普及宣讲——知己知彼可安稳人心,减弱消极情绪。在出现重大突发性事件时,政府迅速取得民众信任对于缓解民众压力和担忧情绪是非常有利的。为了稳定民心,在出现危机时,政府有关部门有必要花大力气介绍相关知识和应对方法。民众对疫情的担忧和恐慌大多来源于他们对疫情的了解过少,自己的不确定性过高。在此基础上政府需要能够正面宣讲疫情的相关知识,而不是选择隐瞒疫情的危险程度和可能产生的后果来暂时性地安抚民心。当民众了解到疫情是如何发生发展的,如何降低自己被传染的可能性,如何帮助家人共渡难关。绝大多数民众能够降低焦虑和恐慌,紧跟政府的指引,做好个人防护,甚至协助政府做好疫情管控工作。

基于此,面对重大突发性事件时,国家可以成立专门的信息宣传小组,负责将相关信息客观公正地传播给大众。由于网络平台的信息表达自由度较大,信息宣传小组需要在事件发生时筛查信息,降低谣言传播的可能性,稳定民心,维持社会稳定。

(二)建设社会心理服务体系——保障心理健康工作质量。与疫情防控工作一样,有序的组织是心理健康工作发挥效能的重要保障。目前,心理健康服务各系统间缺乏有效的合作是导致心理服务体系不完善的主要原因之一。针对疫情的社会心理服务体系建设,我们可以从

以下几个方面着手。第一，疫情防控下的心理健康服务体系的建设：将心理健康与疫情防控社会背景相结合，建设有针对性的社会心理服务体系；第二，建设针对性强科学有效的疫情防控背景下的社会心态培育及心理健康服务方法和策略；第三，在疫情防控常态化背景下，针对全体居民开展心理健康教育与服务，心理健康宣传，心理健康大讲堂以及心理健康团体辅导等工作。

(三) 关注重点群体建立干预机制——降低特殊事件发生的概率。在疫情防控阶段，我们需要对遭受心理危机的社会民众及时开展心理危机干预与疏导工作，要将心理危机干预纳入重大疫情防控整体部署。首先，可定期测量疫情防控下居民的社会心态及心理健康状况，筛查存在轻度和严重心理问题的居民和社会心态预警居民。其次，可以建立分诊转介机制。社区需要与教育、政法以及医疗等系统协调配合，建立分诊转介机制，及时且适时地将存在严重心理问题的居民转介到其他系统。对社会心态轻度预警的居民及存在轻度心理问题的居民开展定期的心理辅导或者心理咨询；对存在严重心理问题的居民及时转介至教育、政法或者医疗系统。

(四) 完善重大危机事件预警机制——早发现早解决、防患于未然。对于此次我国的疫情发展状况来说，各方面都做得较为完善，但是一些地方政府对疫情的预警方面存在不足。当突发事件能够及时发现时，会极大地缓解医疗资源匮乏的局面，并且能够降低事件本身带来的消极影响。基于建议，我国可以成立专门的危机事件监察小组，并且在各地政府成立专职小分队，定期对可能存在的潜在危险进行逐一排查。危险因素较多的地区，如病毒容易藏身的地方，可以在附近的地点设置监察站，一来可以督查其卫生状况，降低病毒存在的可能性，二来监测时可提高关键地区的监测力度和频率。有效的监测预警是解决重大危机的关键

和首要条件。

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不确定性忍受力、强迫、焦虑在大学生神经质人格与失眠间的多重中介作用



被引量: 10

Multiple mediating effects of intolerance of uncertainty, obsessive-compulsive and generalized anxiety on neuroticism and insomnia in college students



摘要: 目的考察不确定性忍受力、广泛性焦虑症状、强迫症状在神经质人格和失眠间的多重中介作用。方法采用阿森斯失眠量表,不确定性忍受力量表,宾州忧虑问卷,强迫量表,艾森克人格问卷对405名大学生进行测查。结果大学生失眠[(4.07&...[展开更多](#)

Objective To explore composited multiple mediating effects of intolerance of uncertainty, generalized anxiety symptoms and obsessive-compulsive symptoms between neuroticism and insomnia. Methods In this study ,405 university students were evaluated using several questi...[MORE](#)

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Neuroticism Insomnia Intolerance of uncertainty Generalized anxiety symptoms Obsessive-compulsive symptoms Multiple mediation model

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儿童青少年焦虑：

—— 发生与 预防

杨智辉 崔 伟
著

ERTONG QINGSHAO NIAN
JIAOLÜ :
FASHENG YU YUFANG

RESEARCH ARTICLE

Passive green space exposure leading to lower aggression: The mediating role of sense of control

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Abstract

Green spaces, integral to natural environments, have been extensively studied for their positive impact on mental health, yet their influence on social behavior, particularly aggression, is less explored. While prior research has predominantly emphasized the effects of actively engaging with nature, the significant role of passive nature exposure—a more common daily occurrence—has often been overlooked. We conducted two studies to explore the influence of passive green space exposure on aggression and the mediating effect of the sense of control. Study 1 ($N = 240$) utilized a cross-sectional survey to assess the relationship between passive green space exposure, sense of control, and aggression. Study 2 ($N = 260$) employed a single-factor between-subjects experimental design to further explore these relationships in a controlled environment. The results from both studies indicated that passive green space exposure is negatively related to aggression, and that this relationship is partially mediated by an increased sense of control. Specifically, passive green space exposure was found to negatively predict aggression by bolstering individuals' sense of control. These findings underscore the potential of enhancing the sense of control through environmental factors like green spaces as an effective strategy to reduce aggression. This study enriches our understanding of the broader impacts of green spaces, extending beyond mental health to include social behaviors. We discussed both the theoretical and practical implications of our findings, highlighting how urban planning and environmental design can incorporate green spaces to foster community well-being and mitigate aggressive behaviors.

KEYWORDS

aggression, compensatory control theory, passive green space exposure, sense of control

1 | INTRODUCTION

Aggression, defined as behavior intentionally aimed to harm or injure others who wish to avoid such treatment (Anderson & Bushman, 2002; Nelson & Trainor, 2007), presents significant social challenges. It leads to various adverse outcomes, including physical and emotional distress, strained relationships, and in extreme cases, self-harm or suicide (Krahé, 2020; Liu, 2004; Nelson & Trainor, 2007). When aggression

escalates to severe physical harm, it crosses into violence, a major global concern recognized by the World Health Organization as a leading cause of mortality among individuals aged 15–44 (Krug et al., 2002).

Environmental factors are known to contribute substantially—up to 50%—to aggressive behavior (Tuvblad & Baker, 2011). Despite this, studies exploring the impact of physical environmental characteristics like air pollution (Perera et al., 2013), noise pollution (Dzhambov & Dimitrova, 2014), temperature (Baron, 1972;

Miles-Novelo & Anderson, 2019, 2022), and weather conditions (Ciucci et al., 2011, 2013) on aggression are sparse (Younan et al., 2016). This highlights a significant gap in understanding how environmental settings, particularly green spaces, may mitigate aggression.

The benefits of green space exposure are well-documented, encompassing enhancements in positive emotions (Barton & Pretty, 2010; Markevych et al., 2017), stress reduction (Lega et al., 2021), decreased illness risk (Alcock et al., 2017; Kingsley, 2019), and improved cognitive function (Browning & Rigolon, 2019; Cherrie et al., 2018; Luque-García et al., 2022; Maes et al., 2021). Moreover, recent studies suggest that green spaces can foster prosocial behavior (Castelo et al., 2021; Liu et al., 2023), indicating their influence on human behavior extends beyond health and well-being to include social interactions.

Given these insights, this study aims to investigate whether passive green space exposure can diminish aggression and to elucidate the underlying mechanisms of this potential relationship. By integrating environmental psychology and social behavior perspectives, this research seeks to provide a comprehensive understanding of how passive interaction with green spaces could serve as a strategic intervention to reduce aggressive behaviors and promote societal harmony.

1.1 | Passive green space exposure and sense of control

Green space exposure is categorized into active and passive (Norwood et al., 2019). Active exposure entails deliberate engagement with nature for therapeutic purposes (Norwood et al., 2019), whereas passive exposure occurs when individuals are present in natural settings without intentional interaction with the environment (Liu et al., 2023; Norwood et al., 2019). Unlike active exposure, which requires deliberate effort, passive exposure involves minimal effort, such as stepping outside or viewing nature through a window.

Passive green space exposure might effectively restore an individual's sense of control, defined as the extent to which an individual believes in their ability to exert personal power and influence over their life and environment (Zarit et al., 2003). This influence operates through two key dimensions of this perception: personal mastery and perceived constraints. Personal mastery reflects an individual's inherent sense of efficacy and skillfulness in achieving goals; perceived constraints pertain to the belief in how much external obstacles or uncontrollable factors impede their efforts (Lachman & Weaver, 1998).

On one hand, exposure to passive green spaces can enhance personal mastery by creating environments conducive to self-reflection (Herzog et al., 1997), which allows individuals to recognize their capabilities and potential, thereby enabling them to plan and regulate their actions more effectively (Clayton & Opatow, 2003; Markus, 1983). As a result, individuals may experience an enhanced sense of personal mastery and overall control.

On the other hand, passive green space exposure can alleviate perceived constraints. According to self-determination theory (Deci

& Ryan, 1985), individuals feel intrinsically motivated when they perceive their actions as self-driven, fostering a sense of control over their environment. This suggests that fulfilling one's autonomy can directly reduce perceived constraints and bolster their sense of control. In social settings, individuals often encounter restrictions imposed by laws, norms, and societal expectations. However, natural environments impose fewer restrictions on an individual's perceptions and actions, thereby enhancing their autonomy (Clayton & Opatow, 2003). The enhancement of autonomy is a crucial factor in strengthening the sense of control, suggesting that residing in areas with abundant green spaces may lead individuals to experience fewer perceived constraints and a higher sense of control.

In summary, individuals with greater passive green space exposure tend to exhibit a more pronounced sense of control compared to those with less exposure. While the body of research on this topic remains limited, existing empirical evidence supports this hypothesis. For example, studies have shown that green space within healthcare settings can enhance patients' sense of control (Weerasuriya et al., 2019), and research indicates that environments that fulfill personal needs can contribute to an enhanced sense of control (Kraus et al., 2012). Green spaces play a role in fulfilling psychological needs through personal recovery (Kaplan & Kaplan, 1989), indirectly supporting the notion that exposure to green spaces can enhance an individual's sense of control.

1.2 | Sense of control and aggression

The sense of control is fundamentally crucial for individuals as it significantly impacts their behavior and well-being. Social learning theory posits that aggressive behaviors may partly arise from a need for environmental control (Felson & Tedeschi, 1993). This theory suggests that a perceived decrease in one's ability to control their environment or circumstances might lead to an increase in aggressive behavior, a notion supported by empirical findings in adolescents. For instance, Guo et al. (2016) found that a lower sense of control can escalate aggression in this demographic. Similarly, Chen, Chen, et al. (2018); Chen, Zuo, et al. (2018) observed that individuals of lower status may exhibit reduced aggressive tendencies when they experience an increased sense of control.

Furthermore, the role of aggression as a coping mechanism for loss of control has been extensively documented. Research indicates that individuals unable to control their surroundings may resort to aggressive behavior to reclaim a sense of control (DeWall et al., 2011; Warburton et al., 2006). This observation aligns with compensatory control theory, which posits that people often seek alternative methods to restore their perceived control to baseline levels when it is diminished (Landau et al., 2015). These studies collectively underline the importance of the sense of control in shaping behavioral responses, particularly aggression.

Building on these insights, we propose that passive green space exposure may reduce aggression, potentially through enhancing the sense of control. Thus, we propose the following hypotheses:

Hypothesis 1. Passive green space exposure reduces people's aggression.

Hypothesis 2. Sense of control mediates the relationship between passive green space exposure and aggression. Specifically, passive green space exposure reduces aggression through an increased sense of control.

1.3 | The present research

The current research explored the proposed hypotheses through two studies conducted with Chinese participants. The selection of China as the study location was strategic, capitalizing on its vast and diverse ecological landscape, which provides a unique opportunity to examine the effects of varying green space exposure on aggression. Furthermore, the cultural emphasis on harmony between nature and humanity in Chinese philosophy aligns closely with our investigation into how environmental factors influence psychological and social behaviors. Additionally, the context of China's ongoing urban greening initiatives, which are subject to debates regarding their economic benefits versus their health and social advantages, offers a pertinent backdrop for evaluating the societal impacts of green space development. This context enhances the relevance of our findings within current public policy discussions, providing valuable insights into the broader implications of environmental planning and its role in public health and social well-being.

Study 1 was designed to investigate the correlation between passive green space exposure and aggression, employing a cross-sectional survey approach. This initial phase assessed participants' levels of passive green space exposure, their sense of control, and aggression, providing a preliminary evaluation of Hypotheses 1 and 2.

Study 2 implemented a single-factor between-subjects experimental design to further explore the causal effects of passive green space exposure on participants' sense of control and aggression. This study was structured to manipulate passive green space exposure directly, measuring subsequent changes in sense of control and aggression to provide robust causal evidence supporting Hypothesis 1 and further testing Hypothesis 2.

Both studies were conducted under the auspices of the Academic Ethics Committee affiliated with the corresponding author's institution. This ensured that all research activities adhered to the highest ethical standards, safeguarding participant welfare and integrity in research practices.

2 | STUDY 1

We preregistered Study 1 (https://aspredicted.org/QQR_7PY) to test the mediating role of sense of control in the relationship between passive green space exposure and aggression.

2.1 | Methodology

2.1.1 | Participants and procedure

We recruited 250 participants from various provinces across China via the online research platform, Credamo (www.Credamo.com), which is a member of ESOMAR (the European Society for Opinion and Marketing Research) and adheres to internationally recognized standards. Before beginning the study, participants were instructed on defining green spaces and completed an online consent form. They then proceeded to respond to scales measuring passive green space exposure, sense of control, aggression, and additional control variables. Each participant received a compensation of 10 Chinese Yuan Renminbi (RMB, approximately \$1.39) upon completing the survey.

To ensure data integrity, four attention-check questions were integrated into the survey. Participants who failed to answer these questions correctly were excluded from the analysis. Ultimately, after removing 10 participants who failed the attention checks (e.g., instructions to select "strongly disagree" for a specific item), the final sample consisted of 240 participants (52.92% male; $M_{\text{age}} = 23.74$, $SD = 4.86$), with 25 from rural areas and 215 from urban settings.

A post hoc power analysis was conducted using G*Power 3.1 (Faul et al., 2007). The analysis confirmed that our final sample size provided sufficient statistical power ($\alpha = .05$, $1 - \beta > .99$) to detect the observed effect size ($f^2 = 0.35$) in a linear multiple regression, ensuring robustness in testing the study hypotheses.

2.1.2 | Measures

Passive green space exposure

According to previous studies (Markevych et al., 2017; Norwood et al., 2019; Shentova et al., 2022), we used a two-item Likert scale to measure passive green space exposure. The scale contains two aspects: green degree (e.g., "How green is your community and surrounding environment, including gardens, trees, parks, and other natural areas?"), and green views outside the window (e.g., "How much greenery is visible from the room where you spend most of your hours at home, including parks, gardens, trees, etc.?"). Participants were asked to rate on a 10-point Likert scale (1 = *little* to 10 = *a lot*), and the responses of both items ($\alpha = .79$) were averaged, with higher scores reflecting a higher level of passive green space exposure.

Sense of control. We measured the sense of control using the Sense of Control Scale developed by Lachman and Weaver (1998). This scale includes 12 items divided into two distinct dimensions: personal mastery and perceived constraints. Personal mastery, which comprises four items, captures an individual's inherent perception of their effectiveness and competence in achieving set goals. Perceived constraints, covered by eight items, reflect the extent to which individuals believe external barriers or factors outside their control

hinder their goal achievement (Lachman & Weaver, 1998). A sample item was "When I want to do something, I usually find a way to succeed." Participants were asked to rate each item on a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree), with items related to perceived constraints undergoing reverse scoring. The overall score was calculated by averaging the responses across all items, with a Cronbach's alpha (α) of 0.95. Higher average scores denote a greater sense of control.

Aggression. We measured aggression with the Buss-Perry Aggression Questionnaire (Buss & Perry, 1992). The scale contains 29 items and measures the following four dimensions of aggression: physical aggression (9 items, $\alpha = .84$, e.g., "I have become so mad that I have broken things"), verbal aggression (5 items, $\alpha = .78$, e.g., "I can't help getting into arguments when people disagree with me"), anger (7 items, $\alpha = .88$, e.g., "When frustrated, I let my irritation show"), and hostility (8 items, $\alpha = .88$, e.g., "I sometimes feel that people are laughing at me behind my back"). All items ($\alpha = .95$) were scored on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). We calculated the mean score for each of the four subscales individually, which provided distinct scores for physical aggression, verbal aggression, anger, and hostility for each participant. To compute an overall aggression score that captures the total tendency toward aggression, we then averaged these subscale scores. Higher average scores indicate a higher overall level of aggression.

Control variables. Building on existing research (Aldwin, 1991; Eagly & Steffen, 1986; Greitemeyer & Sagioglou, 2016), we selected age, gender, education level, income, and subjective socioeconomic status (SES) as potential control variables in our study. The coding for these variables was as follows: gender (male = 1; female = 2), age, education level (primary school = 1, junior high school = 2, vocational high school = 3, high school = 4, college = 5, bachelor's degree = 6, master's degree = 7, PhD degree = 8), monthly income (no income = 1, lower than 2000 RMB = 2, 2001–8847 RMB = 3, 8848–15,000 RMB = 4, 15001–20,000 RMB = 5, 20,001–40,000 RMB = 6, higher than 40,000 RMB = 7), and SES. SES was assessed using the MacArthur Scale of Subjective Social Status (Adler et al., 2000).

2.2 | Results and discussion

2.2.1 | Common method bias test

We conducted confirmatory factor analyses to test whether the self-reported variables of the participants were affected by common method bias (Podsakoff et al., 2003). The results (Table 1) found that the three-factor model, where each construct is treated as separate, exhibited a significantly better fit compared to all alternative models where constructs were combined or treated as a single factor. This significant differentiation among the models supports the conclusion that common method bias does not pose a substantial issue for the validity of our findings in Study 1.

2.2.2 | Correlation analysis

The descriptive statistics and correlations between variables are reported in Table 2. Passive green space exposure was significantly and negatively correlated with aggression ($r = -0.25$, $p < .01$), which support Hypothesis 1. Passive green space exposure was significantly and positively correlated with a sense of control ($r = 0.30$, $p < .001$). Sense of control was highly correlated with aggression ($r = -0.71$, $p < .001$).

In addition, SES showed a significant correlation with passive green space exposure ($r = 0.21$, $p < .01$), sense of control ($r = 0.22$, $p < .001$), and aggression ($r = -0.17$, $p < .01$). Gender, age, and other control variables did not exhibit significant correlations with the key study variables in Study 1.

2.2.3 | Mediating effect of sense of control

The mediating effect of sense of control on the relationship between passive green space exposure and aggression was analyzed using Mplus software, incorporating SES as the sole control variable.

The structural equation modeling results (see Figure 1) demonstrated a good fit to the data: $\chi^2(18) = 44.351$, $p < .001$; CFI = 0.976; RMSEA = 0.078 with a 90% CI = [0.049, 0.107]; and SRMR = 0.041. The total effect of passive green space exposure on aggression was

TABLE 1 Summary of model fit indices in Study 1.

Models	$\chi^2(df)$	CFI	TLI	RMSEA	SRMR	$ \Delta CFI $	$ \Delta RMSEA $
M1: Hypothesized three-factor model	32.446 (13)	0.982	0.962	0.079	0.028		
M2: Two-factor Model	178.854 (15)	0.851	0.721	0.213	0.181	0.131	0.134
M3: Two-factor Model	80.917 (16)	0.941	0.896	0.130	0.069	0.041	0.51
M4: Two-factor Model	164.491 (15)	0.864	0.745	0.204	0.104	0.118	0.125
M5: Single-factor model	179.002 (16)	0.851	0.740	0.206	0.107	0.131	0.127

Note: ΔCFI and $\Delta RMSEA$ represent the model fit difference between the hypothesized three-factor model and the other alternative models. M2: passive green space exposure and sense of control were combined; M3: sense of control and aggression were combined; M4: passive green space exposure and aggression were combined.

TABLE 2 Descriptive statistics and correlations of variables in Study 1.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Passive green space exposure	-															
2. Green degree	0.92***	-														
3. Green view outside the window	0.90***	0.65***	-													
4. Sense of control	0.30***	0.34***	0.20**	-												
5. Personal mastery	0.47***	0.44***	0.41***	0.66***	-											
6. Perceived constraints	0.20**	0.26***	0.11	0.97***	0.46***	-										
7. Aggression	-0.25***	-0.28***	-0.18**	-0.71***	-0.39***	-0.71***	-									
8. Anger	-0.19**	-0.22***	-0.12	-0.68***	-0.43***	-0.67***	0.92***	-								
9. Physical aggression	-0.27***	-0.25***	-0.24***	-0.55***	-0.31***	-0.55***	0.90***	0.77***	-							
10. Hostility	-0.26***	-0.29***	-0.18**	-0.74***	-0.40***	-0.74***	0.90***	0.78***	0.72***	-						
11. Verbal aggression	-0.13*	-0.21**	-0.02	-0.50***	-0.21**	-0.53***	0.77***	0.65***	0.59***	0.62**	-					
12. Gender	0.014	0.02	0.01	0.02	0.002	0.02	-0.06	0.02	-0.13*	-0.05	-0.06	-				
13. Education	-0.04	-0.06	-0.02	0.07	-0.02	0.09	-0.08	-0.08	-0.08	-0.07	-0.07	-0.02	-			
14. Income	0.04	0.04	0.03	0.10	0.17**	0.06	-0.02	-0.05	0.01	-0.06	0.07	0.01	0.05	-		
15. Age	0.06	0.09	0.03	0.09	0.12	0.07	0.05	0.01	0.07	0.003	0.11	0.05	-0.08	0.46**	-	
16. SES	0.21**	0.19**	0.20**	0.22***	0.28***	0.17**	-0.17**	-0.179**	-0.16*	-0.15*	-0.09	0.04	0.11	0.16*	-0.01	-
M	8.57	8.5	8.63	4.63	5.32	4.28	3.58	3.29	3.27	3.78	4.22	1.47	6.71	3.05	23.74	3.46
SD	1.65	1.88	1.75	1.12	0.89	1.42	1.13	1.30	1.22	1.35	1.24	0.5	0.94	1.27	4.89	0.65

Abbreviation: SES, socioeconomic status.

* $p < .05$; ** $p < .01$; *** $p < .001$.

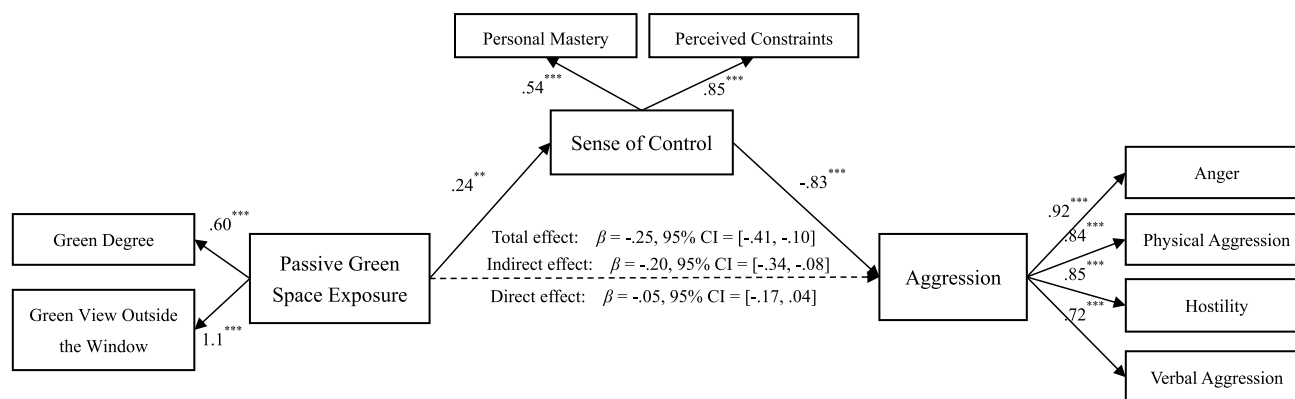


FIGURE 1 The mediation effect of sense of control (Study 1). The above path coefficients were all standardized. Black solid lines indicate that the pathways were significant. SES was used as a control variable but is not shown in the figure. ** $p < .01$, *** $p < .001$.

found to be negative and significant ($\beta = -.249$, 95% CI = [-0.405, -0.098]). The indirect effect between passive green space exposure and aggression through the sense of control was significant ($\beta = -.198$, 95% CI = [-0.335, -0.080]), while the direct effect was not significant ($\beta = -.051$, 95% CI = [-0.161, 0.033]). Specifically, passive green space exposure was positively related to sense of control ($\beta = .239$, 95% CI = [0.093, 0.394]), and a higher sense of control was associated with lower levels of aggression ($\beta = -.830$, 95% CI = [-0.946, -0.716]). These results supported Hypothesis 2.

It is important to clarify that a power analysis to determine the required sample size was not conducted before Study 1; rather, a post-hoc power analysis was performed after the completion of the study. Despite this procedural sequence, the results from Study 1 suggest that the sample size was, indeed, sufficient to detect significant effects.

3 | STUDY 2

Study 1 supported the main effect of passive nature exposure on aggression (Hypothesis 1) and the mediating role of a sense of control (Hypothesis 2). Based on this, we preregistered Study 2 (https://aspredicted.org/SCF_P2G), was designed to further investigate the causal relationship between passive green space exposure and aggression, and to examine the mediating role of sense of control in this relationship.

Furthermore, Study 2 also aims to exclude an alternative mechanism, that is, perceived SES. This approach was informed by preliminary findings suggesting that areas with higher SES tend to have more abundant and higher-quality green spaces (Ghanem & Edirisinghe, 2024). Such conditions may lead participants to perceive individuals residing in areas with plentiful green spaces as having higher SES compared to those in areas with less greenery. Prior research indicates that individuals with higher SES typically exhibit lower levels of aggression compared to those with lower or middle SES (Greitemeyer & Sagioglou, 2016). Accordingly, this facet of the study was designed to explore whether perceived SES acts as a

confounding variable, potentially mediating the relationship between passive green space exposure and aggression.

3.1 | Methodology

3.1.1 | Participants and procedure

We conducted an a priori power analysis using G*Power 3.1 (Faul et al., 2007) to determine the required sample size for detecting the effect of passive green space exposure on aggression. This analysis indicated that a sample of 260 participants would provide adequate power ($\beta = .80$) to detect a small to medium effect size ($d = 0.35$) using a t-test (two-tailed). Subsequently, we collected 260 valid questionnaires (58.8% female; $M_{age} = 31.79$, $SD = 7.61$) via the online platform “Credamo,” after excluding participants who failed at least one attention check question. The sample included 29 individuals from rural areas and 231 from urban settings.

The study utilized a one-way between-subjects design to compare high versus low passive green space exposure conditions. Participants were randomly assigned to either the high exposure group (130 participants) or the low exposure group (130 participants). Following assignment, participants completed scales measuring their sense of control and aggression, enabling us to assess the direct impact of green space exposure on these variables.

3.1.2 | Measures

Manipulation of passive green space exposure

Participants were randomly assigned to one of two groups, each exposed to distinct scenarios through images and accompanying text that portrayed different levels of passive green space exposure within a hypothetical community (see Figure 2). The scenarios were presented as part of a visualization exercise in which participants were instructed to imagine living in the depicted environment for 5 years. In the high exposure condition, the imagery and narrative encouraged participants to



FIGURE 2 The pictures of two conditions of passive green space exposure level. (a) high passive green space exposure; (b) low passive green space exposure. [Color figure can be viewed at wileyonlinelibrary.com]

envision living in a community richly endowed with lush, year-round vegetation. The description suggested they could look out their window at any moment to see a vibrant and verdant landscape. Conversely, in the low exposure condition, participants were prompted to imagine residing in a community where green spaces were scarce and the environment was largely barren. The view from their window, as described, would primarily include a nondescript building, gray roads, and a variety of vehicles, with minimal vegetation. Following the exposure to these scenarios, participants were asked to write a brief statement (30–50 words) reflecting their feelings about living in the described community. Subsequently, they completed a manipulation check by rating the perceived level of passive green space exposure on a scale from 1 (very low) to 10 (very high), to confirm the effectiveness of the manipulation.

Sense of control

The Sense of Control scale used in Study 2 was retained in Study 1 ($\alpha = .97$).

Aggression

To measure aggression, we used a set of vignettes created by Tremblay and Belchevski (2004) that were designed to simulate provocative scenarios in which participants could envision themselves. Three scenarios consisted of three distinct vignettes representing varying levels of provocation: Unintentionally, ambiguously, and intentionally. Each vignette aimed to provoke different levels of aggressive responses, influenced by the perceived intent and intensity of the provocation: (1) Unintentional Provocation Vignette: “A group of teenagers are playing Frisbee in the park. The Frisbee hits you in the nose really hard. One of the teenagers runs over to you to see if you’re ok.” (2) Ambiguous Provocation Vignette: “You are carrying a heavy load of groceries up to a check-out line at the grocery store and just as you are about to enter in line, someone cuts in front of you. You end up dropping some things on the floor.” (3) Intentional Provocation Vignette: “You are at the movies with

your friends, and some teenagers behind you keep kicking the back of your seat. One of your friends gives them a dirty look, but they continue kicking your seat even harder.”

After reading each vignette, participants responded to six questions measuring their likelihood of reacting aggressively. They rated their responses on a scale from 0 (not likely at all) to 10 (extremely likely). The six items were: (1) “To what extent would you feel angry in the situation described?” (2) “To what extent would you show your anger to him/her in the situation?” (3) “To what extent would you be rude to him/her in the situation?” (4) “To what extent would you yell at or curse the other person in the situation?” (5) “If the situation was not resolved, to what extent would you threaten him/her?” (6) “If the situation was not resolved, to what extent would you use physical force (e.g., pushing or grabbing)?” Each participant’s aggression score was calculated as the average of their responses to the six items, with possible scores ranging from 0 (not likely at all) to 10 (extremely likely). The overall score was obtained by averaging the responses across the six questions, resulting in a Cronbach’s alpha (α) of .92. Higher average scores indicate a greater propensity for aggression.

Perceived SES

Perceived SES was assessed by asking participants in both the high and low passive green space exposure conditions to estimate their SES in the given scenario using the MacArthur Scale of Subjective Social Status (Adler et al., 2000).

3.2 | Results and discussion

3.2.1 | Passive green space exposure manipulation test

One-way analysis of variance (ANOVA) demonstrated significant differences between the two conditions on the passive green space exposure manipulation check items, $F(1, 259) = 4046.766$, $p < .001$,

$\eta^2 = 0.94$. Participants in the high passive green space exposure condition perceived higher levels of passive green space exposure ($M = 8.76$, $SD = 1.00$) compared to participants in the low passive green space exposure condition ($M = 2.07$, $SD = 0.65$). These results indicate that the manipulation of passive green space exposure was effective.

3.2.2 | Effect of passive green space exposure on aggression

The ANOVA further indicated significant differences in aggression between the two conditions, $F(1, 259) = 91.998$, $p < .001$, $\eta^2 = 0.26$. Participants in the high passive green space exposure condition reported lower aggression ($M = 4.00$, $SD = 1.46$) than those in the low passive green space exposure condition ($M = 5.92$, $SD = 1.75$). This suggests that higher exposure to green spaces is associated with reduced aggression. These results demonstrate that individuals exposed to higher levels of passive green spaces exhibit reduced aggression, thereby supporting Hypothesis 1.

3.2.3 | Correlation analysis

The descriptive statistics and correlations between variables are reported in Table 3. Manipulation group was significantly correlated

with aggression ($r = -0.51$, $p < .001$) and sense of control ($r = 0.62$, $p < .001$). Sense of control was significantly correlated with aggression ($r = -0.57$, $p < .001$). In addition, perceived SES was significantly correlated with manipulation group ($r = 0.79$, $p < .001$), the sense of control ($r = 0.68$, $p < .01$), and aggression ($r = -0.49$, $p < .001$).

3.2.4 | Mediating effect of sense of control

The mediating effect of sense of control on the relationship between passive green space exposure and aggression was examined using SPSS 23. The results (see Figure 3) showed that mediating effect of sense of control was significant ($\beta_{\text{indirect effect}} = -0.26$, $SE = 0.05$, $p < .001$, 95% CI = $[-0.36, 0.17]$). These results supported Hypothesis 2, indicating that sense of control mediated the relationship between passive green space exposure and aggression.

3.2.5 | Additional analysis: Mediating effect of sense of control and perceived SES

The mediating effect of sense of control and perceived SES on the relationship between passive green space exposure and aggression was examined using SPSS 23. Treating sense of control and perceived SES as parallel mediators, the results showed that mediating effect of sense of control was significant ($\beta_{\text{indirect effect}} = -0.25$, $SE = 0.05$,

TABLE 3 Descriptive statistics and correlations of variables in Study 2.

	M	SD	1	2	3	4	5
1. Manipulation Group	-	-	-				
2. Sense of Control	4.59	1.62	0.62***	-			
3. Personal Mastery	4.82	1.57	0.62***	0.96***	-		
4. Perceived Constraints	4.48	1.69	0.61***	0.99***	0.91***	-	
5. Aggression	4.96	1.87	-0.51***	-0.57***	-0.53***	-0.58***	-
6. Perceived SES	5.41	1.91	0.79***	0.68***	0.69***	0.66***	-0.494***

Abbreviation: SES, socioeconomic status.

* $p < .05$; ** $p < .01$; *** $p < .001$.

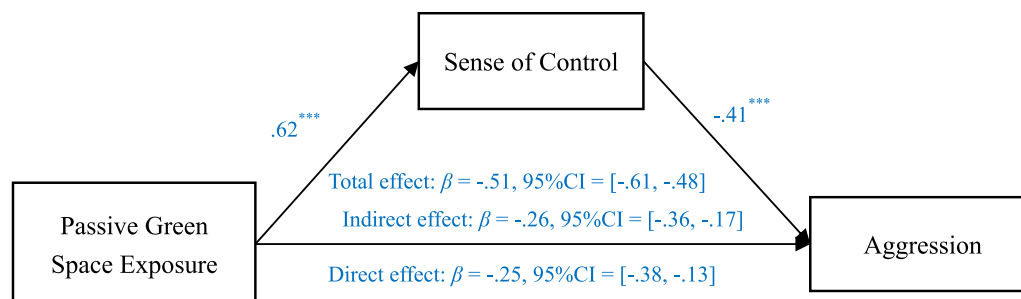


FIGURE 3 The mediation effect of sense of control (Study 2). The above path coefficients were all standardized. *** $p < .001$. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/ab.22158)]

$p < .001$, 95% CI = $[-0.36, 0.16]$), while the mediating effect of perceived SES was nonsignificant ($\beta_{\text{indirect effect}} = -0.03$, SE = 0.07, $p = .72$, 95% CI = $[-0.18, 0.11]$). These results supported Hypothesis 2, indicating that sense of control mediated the relationship between passive green space exposure and aggression, while the alternative mediator, that is, perceived SES, was excluded.

4 | GENERAL DISCUSSION

Green space exposure is widely recognized for its positive impacts on physical and mental health, but its influence on social behavior has been less explored. Our study extends this body of research by investigating how passive green space exposure can mitigate aggression. In Study 1, we found correlational evidence supporting our first hypothesis, demonstrating a negative relationship between passive green space exposure and aggression. This finding was further substantiated by Study 2, which provided causal evidence that passive green space exposure can effectively reduce aggressive behaviors. This aligns with previous research indicating that higher vegetation density in urban areas correlates with lower violent crime rates (Eugenia et al., 2013; Kuo & Sullivan, 2001). Additionally, research on adolescents has shown a significant association between the presence of vegetation around schools and reduced aggression among students (Zhang et al., 2023).

Our research presents a novel approach to reducing aggression through environmental design. Traditionally, interventions to mitigate aggression have focused on modifying social environments, such as improving family dynamics, peer interactions, and living conditions (Fiske et al., 2010). However, these strategies can be challenging to implement effectively and may not always be cost-efficient for policymakers. Our findings emphasize the critical role of natural environments in this context, suggesting that residing in vegetated areas can significantly lower aggression levels. The implications of our results are profound for societal and governmental decision-making. They suggest that urban and environmental planning that incorporates green spaces could be a strategic approach to address aggressive behaviors, offering a practical and potentially cost-effective solution for enhancing public safety and well-being.

Additionally, the current study illuminates the mediating role of the sense of control in the relationship between passive green space exposure and aggression (Hypothesis 2). It suggests that passive exposure to green spaces may mitigate aggression by enhancing individuals' sense of control. The concept of sense of control, which refers to an individual's perceived influence over events and outcomes, does not always equate to actual control (Haggard & Tsakiris, 2009). In other words, feeling in control is distinct from having control, as negative experiences can substantially reduce one's perceived control (Thompson et al., 1993), yet individuals with a robust sense of control are often better equipped to manage the aftermath of such experiences (Ross & Mirowsky, 2013). For instance, research by Ren et al. (2018) illustrates that while social

exclusion generally triggers aggression, opportunities to regain control can significantly reduce such aggressive responses, aligning excluded individuals' behaviors with those of their non-excluded peers. This finding underscores the potential for environmental design to enhance the sense of control, thereby offering a strategic avenue to mitigate various negative social behaviors.

Furthermore, our study contributes to the expansion of compensatory control theory by providing empirical evidence that passive green space exposure can serve as an effective means for individuals to restore a sense of control, thereby potentially reducing aggressive behaviors. This finding reinforces the core premise of the theory, which posits that individuals seek alternative methods to regain control when it is perceived to be under threat (Landau et al., 2015). Additionally, our results underscore the psychological benefits of green spaces, as evidenced by the work of Bratman et al. (2019). Our research uniquely contributes to the discourse by illustrating how urban planning and environmental design that incorporate green spaces can be employed strategically to enhance societal well-being and mitigate aggression. This approach offers a novel perspective on addressing psychological and social challenges through environmental influences, thereby enriching the understanding of how environments can impact human behavior.

4.1 | Limitations and future directions

The current study's focus on Chinese participants presents certain limitations, particularly in understanding how the influence pathways identified are shaped by unique cultural characteristics inherent to Chinese society. The sense of control, which varies significantly across cultures, is central to this discussion. For example, in Western countries characterized by individualistic values such as the United States, a strong sense of control is often linked to greater happiness and health. In contrast, in collectivist cultures like Japan, the impact of sense of control on these outcomes tends to be less pronounced, as documented by Kitayama et al. (2010). This variation may stem from fundamental differences in how control is perceived across different cultures; for instance, research indicates that Japanese individuals typically perceive less personal control compared to their British counterparts (O'Connor & Shimizu, 2002). Given the complexity of these cultural nuances, it is crucial for future research to engage in multi-country studies that cover a broad spectrum of cultural values. This approach would enhance the generalizability of our findings, allowing for a more comprehensive understanding of the effects of passive green space exposure on aggression across diverse cultural settings.

Additionally, while our study has highlighted the mediating role of the sense of control between passive green space exposure and aggression, it is important to recognize that other internal mechanisms could also significantly influence this relationship. Future research should explore additional potential mediators, such as the influence of awe—a profound emotional response to stimuli that are perceived as vast and surpass one's current understanding of the

world (Keltner & Haidt, 2003). Exposure to natural environments often evokes feelings of awe, which various studies have shown can significantly impact human behavior. For instance, research has demonstrated that walking in natural settings can trigger awe (Ballew & Omoto, 2018; Lopes et al., 2020), which has been associated with a reduction in aggressive behaviors (Yang et al., 2016). Investigating the role of awe and other similar emotional responses could provide deeper insights into the complex interplay between environmental factors and human behavior. Such research would not only validate the findings from our current study but also expand our understanding of the various mechanisms through which passive exposure to green spaces can influence psychological and social outcomes.

Furthermore, our study did not investigate potential moderating variables that could enhance the effectiveness of passive green space exposure in reducing aggression. Understanding such factors could provide more comprehensive strategies for policymakers and urban planners. One promising moderating variable is openness to experience—a personality trait characterized by a willingness to embrace new ideas, experiences, and environments (McCrae & Greenberg, 2014). Individuals with high levels of openness often seek novelty, value diversity, and are more attuned to beauty in both natural and artificial settings (Feist & Brady, 2004; McCrae & Costa, 1997). Consequently, these individuals may experience a stronger connection to diverse and novel natural environments, which could lead to enhanced benefits, including a greater sense of control and a reduction in aggression. Thus, exploring the moderating role of openness to experience could significantly expand the scope of our findings. It would not only deepen our understanding of the mechanisms through which green spaces impact human behavior but also assist in designing targeted interventions that leverage personality traits to maximize the benefits of urban green spaces.

In addition to its core findings, our study presents passive green space exposure as a potential systemic strategy to mitigate the effects of heat on aggression. The correlation between increased temperatures and elevated levels of aggression has been well-documented, with scholars suggesting that heat acts as a catalyst for aggressive behaviors both at individual and systemic levels (Miles-Novelo & Anderson, 2019, 2022). Our research indicates that urban green spaces could serve as vital buffers against the stressors induced by climate change, thereby underscoring the significant role of urban environmental design in public health and social welfare strategies. This perspective aligns with the notion that thoughtful environmental design is crucial in combatting climate-related increases in aggression, as explored by Anderson and DeLisi (2011) in their study of environmental factors affecting aggressive behaviors.

Recognizing the limitations of our study's geographic focus and cross-sectional design, we advocate for future research to explore the longitudinal effects of green space exposure across diverse climates and cultures. Additionally, we recommend incorporating objective environmental measures, such as urban heat island intensity, to deepen the understanding of these complex interactions. This approach not only amplifies the impact of our findings but also

encourages a multidisciplinary exploration of systemic solutions to the psychological and social challenges posed by global warming. Such studies could provide more definitive evidence on the role of green spaces in mitigating the adverse effects of climate change on human behavior.

ACKNOWLEDGMENTS

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data presented in this study are available on request from the corresponding author.

ETHICS STATEMENT

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Beijing Forestry University (protocol code: BJFUPSY-2024-014; date of approval: 2024/01/15).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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RESEARCH ARTICLE

Unraveling the longitudinal relationships between connectedness to nature, depressive symptoms, and learning burnout in adolescents

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Abstract

Introduction: Following the conservation of resource theory and natural stress reduction theory, the current study investigated mediated pathways, reverse mediated pathways, and reciprocal pathways between connectedness to nature, depressive symptoms, and adolescent learning burnout via a half-longitudinal analysis, and discussed gender differences in the three models.

Methods: Two waves of data were collected in December 2022 (T1) and June 2023 (T2) for this study. The sample consisted of 1092 Chinese adolescents (52.20% girls, $M_{\text{age}} = 13.03$, $SD = 1.43$). Semi-longitudinal analyses were conducted to examine the relationship between connectedness to nature, depressive symptoms, and adolescent academic burnout.

Results: The results indicated that connectedness to nature can serve as a positive resource to alleviate the levels of depressive symptoms among adolescents and thereby decrease learning burnout. However, the protective effect of connectedness to nature was smaller, and the decreasing effect of learning burnout on connectedness to nature was stronger than the alleviating effect of connectedness to nature on learning burnout. Additionally, the study found that depressive symptoms and academic burnout have a mutually reinforcing effect over time and that the effects of this interaction are more pronounced in females.

Conclusions: The present study emphasizes the protective role of nature connectedness and the detrimental effects of learning burnout in adolescents.

KEYWORDS

connectedness to nature, depressive symptoms, learning burnout, longitudinal study

1 | INTRODUCTION

Adolescents are in an important period of cognitive development, and academic stress is one of the sources of stress for adolescents that can easily lead to learning burnout (Jiang et al., 2021). Learning burnout, a state of exhaustion due to academic pressure, is a common psychological phenomenon prevalent in Asia and Europe (Gabola et al., 2021; Gao, 2023; Kinnunen et al., 2016; Lee et al., 2020). Learning burnout is more prominent among Chinese adolescents than in other countries (Lacombe et al., 2023). In 2020, the China Care for the Next Generation Working Committee conducted a survey on learning burnout in primary and secondary schools. The findings indicated that more than 30% of primary school students experienced learning fatigue, while the percentage increased to more than 70% among secondary school students, reflecting a higher prevalence of learning burnout (Gao, 2023). Learning burnout is known to be associated with various negative consequences, such as heightened levels of depression and anxiety, physical symptoms, internet addiction, and a greater likelihood of school dropout (Li et al., 2023; Qin et al., 2023; Walburg, 2014). Depression is now the most common psychological problem among adolescents. Previous research has indicated that adolescents with higher levels of depression

may also experience higher levels of learning burnout (Baptista et al., 2022). Negative emotions are often not conducive to creating a positive and favorable learning atmosphere. As a result, adolescents may lack the energy and enthusiasm needed to cope with their daily academic tasks.

There may exist a significant association between connectedness to nature, depressive symptoms, and adolescent learning burnout. Connectedness to nature refers to the degree of emotional and experiential connection and identification individuals have with the natural world (Mayer & Frantz, 2004). Previous studies indicated a negative correlation between nature connectedness and academic burnout (Vermeesch et al., 2022; Wang et al., 2023). Moreover, as proposed in the study conducted by Sterckx et al. (2021), connectedness to nature has the potential to serve as a restorative factor in burnout interventions, implying a potential positive influence of connectedness to nature in reducing adolescent learning burnout. The beneficial outcomes of nature connectedness primarily manifest through the positive impact of natural elements on the physical and mental health of individuals (Garza-Terán et al., 2022; Yang et al., 2017). Extensive evidence also demonstrates that a high level of connectedness to nature has the potential to improve cognitive functioning, alleviate symptoms of depression and anxiety, and enhance overall life satisfaction, among various other benefits (Joschko et al., 2023; Maes et al., 2021; Pasanen et al., 2018; White et al., 2019, 2021; Yin et al., 2020). However, it is important to note that the longitudinal design is lacking, which hinders our ability to establish causality or determine the long-term effects, as well as the underlying mechanisms. This study will use a longitudinal design approach to deepen our understanding of how natural connections influence adolescents' academic performance and the role of depressive symptoms in this.

1.1 | Connectedness to nature and learning burnout

Previous studies have found that nature connectedness influences academic performance in adolescents (Carver et al., 2022; Kuo et al., 2021; Rahai et al., 2023). Even after controlling for socioeconomic factors, the presence of the green space surrounding the school positively predicted student academic achievement. Specifically, schools with more green space demonstrated significantly higher school-wide academic achievement compared to schools with less green space (Kuo et al., 2021). Ulset et al. (2022) further illustrated the impact of nature on learning performance. Their 10-year follow-up study of 555 children aged between 12 and 78 months concluded that exposure to nature could indirectly influence an individual's subsequent academic performance in at least two ways. First, through the cognitive pathway, it promotes the development of brain structures, improves working memory, and reduces inattention. Second, through the social pathway, it enhances pro-social behaviors and facilitates interpersonal interactions in young children. Furthermore, previous research revealed that medical students who spent a minimum of 120 min per week in natural environments were able to effectively alleviate their learning burnout (Vermeesch et al., 2022). Moreover, inspired by the study of Dong and Geng (2023), in which resource loss was extended to the condition of natural contact resources, connectedness to nature may be also suitable to be considered as a kind of resource. According to the conservation of resource theory (COR), an individual's possession and maintenance of various resources (such as time, money, mental health, optimism, social support, work environment, and other physical, conditional, individual characteristics, and energy resources) predict their stress levels and optimal functioning. When an individual experiences a loss of these resources or an imbalance in them, it results in their inability to adapt effectively to life, leading to a negative state similar to burnout (Alarcon et al., 2011; Hobfoll et al., 2015, 2018). Dong and Geng (2023) emphasized that the absence of natural resources can have detrimental effects on other resources, thereby impacting the mental health of adolescents. These studies suggest that engaging with nature may help individuals prevent resource depletion, resulting in improved learning outcomes. However, there have been limited studies exploring the impact of natural connections on adolescent learning burnout, and longitudinal investigations on this topic are scarce. Therefore, the primary objective of this study is to elucidate the relationship between connectedness to nature and learning burnout through a longitudinal design.

1.2 | The mediating role of depressive symptoms

The natural environment provides a conducive setting for individuals to alleviate their emotional state. According to the natural stress reduction theory (SRT), exposure to non-threatening natural stimuli triggers psychophysiological responses that reduce stress and elicit pleasant feelings by diminishing the sensitivity of the nervous system (Ulrich et al., 1991). Previous studies have examined the association between connectedness to nature and depressive symptoms. In a recent meta-analysis conducted by Coventry et al. (2021), nature-based interventions were found to have a significant positive impact on alleviating depressive symptoms across both patient and non-patient populations. Furthermore, the researchers identified that the primary mechanism through which nature influences depressive symptoms is by enhancing restorative experiences that facilitate an individual's recovery from stress and negative influences (Meuwese et al., 2021). In short, establishing a connection with nature has the potential to aid individuals in their recovery from depressive symptoms.

According to COR, an individual's mental health plays a significant role in the development of burnout. In a study conducted by Chiu et al. (2015) investigating the prevalence of burnout among individuals with depression, it was found that burnout was more prevalent in this particular group. Multiple regression analysis revealed that depressive symptoms accounted for 48% of the variance in burnout scores. Considering the link between burnout and learning burnout, it can be hypothesized that depressive symptoms also influence the occurrence of learning burnout. A previous study found that depressive symptoms were a significant predictor of the developmental trajectory of learning burnout among adolescents (Lee & Lee, 2018). Specifically, individuals who experienced depressive symptoms tended to exhibit higher levels of learning burnout over time.

In summary, the integration of the COR and SRT suggests that the alleviation of learning burnout through nature connectedness can be attributed to nature's restorative effect on emotions. This effect may help adolescents preserve their emotional resources and, consequently, reduce the occurrence of learning burnout. Accordingly, the purpose of this study was to examine the role of depressive symptoms in the relationship between nature connectedness and learning burnout among adolescents using a longitudinal design. Furthermore, considering adolescent development, Sameroff and Mackenzie (2003) proposed a transactional model that highlights the dynamic and interactive relationship between individuals and their external environment over time. Thus, it is essential to study not only the one-way relationships between variables but also the reciprocal influences. To get a more complete picture of the relationship among the three variables, this study also explored the reverse effect of adolescent academic burnout on natural connections through depressive symptoms and examined whether there was a causal relationship between the three variables.

When collating previous research, it was found that girls exhibited significantly higher levels of depressive symptoms and academic burnout compared to boys (Salk et al., 2017; Vansoeterstede et al., 2023). Additionally, Xiang et al. (2022) discovered that the link between nature contact and mental health was stronger for girls in terms of adolescent nature connection. Consequently, this study also explored whether there are any gender differences in the relationship between connectedness to nature, depressive symptoms, and learning burnout.

1.3 | The current study

Recent cross-sectional studies have established a connection between nature connectedness and adolescent learning burnout (Vermeesch et al., 2022; Wang et al., 2023). However, there is a scarcity of research examining the longitudinal pathways between nature connectedness and learning burnout, as well as the reverse and reciprocal pathways. Drawing upon the COR, SRT, and the transactional model, the current study aimed to investigate the influence of nature connectedness on learning burnout through depressive symptoms in adolescents, as well as the reverse influence, and whether these influences are reciprocal. It also discussed gender differences in the model. The study aimed to examine four hypotheses:

H1: Connectedness to nature predicts depressive symptoms longitudinally, which subsequently predicts learning burnout in adolescents (Figure 1a).

H2: Adolescents learning burnout has a reverse effect on nature connectedness through depressive symptoms over time (Figure 1b).

H3: There exists a reciprocal relationship among the three variables over time (Figure 1c).

H4: There are significant differences between genders in the mediation model, reverse mediation model, and reciprocity mediation model.

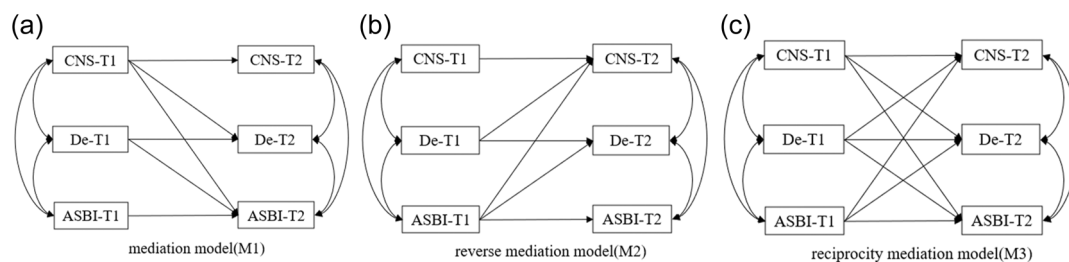


FIGURE 1 The hypothesized models to be tested in the study (a–c). ASBI, adolescent student burnout inventory; CNS, connectedness to nature; De, depressive symptoms; T1, Time 1; T2, Time 2.

Additionally, the study accounted for participants' gender, age, parental education, type of household, and household income level in all three models. This consideration was based on prior research indicating correlations between these factors and the variables under investigation (Horoz et al., 2022; Salk et al., 2017; Turhan et al., 2023; Walburg, 2014; Zhou et al., 2018).

2 | METHODS

2.1 | Participants

Participants were committed as part of an ongoing longitudinal research project that focuses on adolescents' mental health. The participants were from primary and secondary schools in Shandong Province, Hunan Province, and Chongqing, China. The participants comprised fourth and fifth-grade students in primary school and seventh and eighth-grade students in secondary school. There were 1543 participants at T1 (50.60% girls; mean age was 12.73 ± 1.53 years old) and 1614 participants at T2 (50.40% girls; mean age was 13.30 ± 3.74 years old). At each time point, the participants were excluded due to temporary absence or short response time. Thus, A total of 1092 participants (52.20% girls) ranging from 10 to 16 years old ($M = 13.03$, $SD = 1.43$) were incorporated into the final sample. The attrition rate from T1 to T2 was 29.23%. We conducted Little's missing completely at random test to check the pattern of the missing data. The results showed that the data was missing at random ($\chi^2 = 1089.20$, $p < .01$). The missing data was handled using full information maximum likelihood. The demographic information is presented in Table 1.

2.2 | Procedures

All methods and procedures were approved by the university's research ethics committee before beginning data collection. All participants, including children, parents, and teachers, consented to participate in the study, and informed consent was obtained. Informed consent from parents was obtained through the classroom teacher, who distributed an online link via WeChat groups. The questionnaires were administered in an online format. Two waves of data were collected in December 2022 (T1) and June 2023 (T2). There was a semester in the 6-month interval between T1 and T2.

TABLE 1 Demographic information of the sample.

Demographic information	Level	Percentage (%)
Fathers' education	Junior middle school or blow	83.20
	Senior middle school	15.60
	Bachelor's degree or higher	1.20
Mothers' education	Junior middle school or blow	86.00
	Senior middle school	12.10
	Bachelor's degree or higher	1.90
Monthly household income (yuan)	<2000	18.59
	2000–5000	55.22
	5000–10,000	21.98
	10,000–30,000	3.75
	>30,000	0.46
Grade	Fourth grade	17.40
	Fifth grade	14.70
	Seventh grade	35.30
	Eighth grade	32.60

2.3 | Measures

2.3.1 | Connectedness to nature scale (CNS)

The CNS is a 14-item self-report instrument assessing their feelings of closeness with nature (Mayer & Frantz, 2004). Each item is rated on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The CNS has been demonstrated to have good reliability and validity in Chinese samples (Li & Wu, 2016). For the present sample, the Cronbach's α was .82 at both T1 and T2. The CNS scale showed an acceptable model fit (T1: $\chi^2/df = 6.67$, root mean square error of approximation [RMSEA] = 0.07, comparative fit index [CFI] = 0.95, Tucker–Lewis index [TLI] = 0.93, standardized root mean square residual [SRMR] = 0.04; T2: $\chi^2/df = 6.90$, RMSEA = 0.07, CFI = 0.95, TLI = 0.94, SRMR = 0.05).

2.3.2 | Depression anxiety stress scales-21 (DASS-21)

The DASS-21 is a 21-item self-report instrument measuring the emotional state of depression, anxiety, and stress (Lovibond & Lovibond, 1995). The scale includes three subscales: depression (seven items), anxiety (seven items), and stress (seven items). Each item is rated on a 4-point Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). The DASS-21 has been shown to have good reliability and validity in Chinese samples (Wen et al., 2012). Only the depression subscale was used in this study. In this sample, the Cronbach's α was .91 at both T1 and T2. The DASS-21 scale had an acceptable model fit (T1: $\chi^2/df = 4.46$, RMSEA = 0.06, CFI = 0.99, TLI = 0.99, SRMR = 0.02; T2: $\chi^2/df = 6.63$, RMSEA = 0.07, CFI = 0.99, TLI = 0.98, SRMR = 0.02).

2.3.3 | Adolescent student burnout inventory (ASBI)

This instrument is composed of 16 items that evaluate academic burnout in adolescents (Wu et al., 2010). The scale consists of three dimensions: exhaustion (four items), learning cynicism (five items), and reduced efficacy (seven items). Each item is assessed on a 5-point Likert scale ranging from 1 (*did not apply to me at all*) to 5 (*applied to me very much or most of the time*). In this sample, the Cronbach's α was .82 at T1, and the Cronbach's α was .84 at T2. The ASBI scale had an acceptable model fit (T1: $\chi^2/df = 6.97$, RMSEA = 0.07, CFI = 0.92, TLI = 0.90, SRMR = 0.07; T2: $\chi^2/df = 6.82$, RMSEA = 0.07, CFI = 0.93, TLI = 0.92, SRMR = 0.07).

2.4 | Data analysis

To obtain an initial overview of the variables, preliminary analysis, including descriptive statistics and Pearson's correlation, were conducted with the SPSS22.0. Then, considering that we collected two waves of data, a half-longitudinal analysis using structural equation modeling (SEM) was performed with Mplus7.4 (Cole & Maxwell, 2003). We conducted a half-longitudinal analysis to test for causal mediation between the relevant constructs.

In the SEM, we used participants' gender, age, parental education, type of household, and household economic income level as control variables. Then we first computed the mediation model (M1: CNS-De-ASBI) of our main interest utilizing a half-longitudinal analysis. The indirect effect of CNS on ASBI was tested by the Sobel test. Meanwhile, to completely clarify the relationship between the variables, we tested the reverse mediation model (M2: ASBI-De-CNS) and the reciprocity model. Finally, we examined whether there were differences across gender on the three models.

Additionally, the model fit was assessed using a few indices: the CFI, the TLI, the SRMR, and the RMSEA. For large samples, CFI above or equal to 0.90 are acceptable, and SRMR and RMSEA below or equal to 0.08 are acceptable.

3 | RESULTS

3.1 | Descriptive statistics and correlations

Sample sizes, means, SDs, and intercorrelations for the three variables at T1 and T2 are shown in Table 2. Specifically, on both measures, connectedness to nature was significantly negatively correlated with depressive symptoms ($r_{T1} = -.12$, $p < .01$, $r_{T2} = -.11$, $p < .01$), connectedness to nature was significantly negatively correlated with learning burnout ($r_{T1} = -.37$, $p < .01$, $r_{T2} = -.35$, $p < .01$), and depressive symptoms were significantly positively correlated with learning burnout ($r_{T1} = .50$, $p < .01$, $r_{T2} = .56$, $p < .01$).

TABLE 2 Descriptive statistics and inter-factor correlations.

	Variables	N	M ± SD	1	2	3	4	5	6
Whole sample	1. CNS-T1	1092	47.62 ± 9.12	-					
	2. De-T1	1092	3.52 ± 4.11	-.12**	-				
	3. ASBI-T1	1092	42.42 ± 10.20	-.37**	.50**	-			
	4. CNS-T2	1092	47.22 ± 9.26	.31**	-.12**	-.27**	-		
	5. De-T2	1092	3.59 ± 4.21	-.17**	.38**	.40**	-.11**	-	
	6. ASBI-T2	1092	42.27 ± 11.26	-.19**	.35**	.57**	-.35**	.56**	-
Male	1. CNS-T1	522	47.20 ± 9.60	-					
	2. De-T1	522	3.36 ± 3.99	-.12**	-				
	3. ASBI-T1	522	42.12 ± 10.04	-.41**	.41**	-			
	4. CNS-T2	522	47.11 ± 9.79	.30**	-.14**	-.30**	-		
	5. De-T2	522	3.20 ± 3.87	-.20**	.28**	.34**	-.09*	-	
	6. ASBI-T2	522	41.45 ± 10.78	-.24**	.22**	.55**	-.39**	.48**	-
Female	1. CNS-T1	570	48.01 ± 8.66	-					
	2. De-T1	570	3.68 ± 4.23	-.13**	-				
	3. ASBI-T1	570	42.70 ± 10.34	-.33**	.57**	-			
	4. CNS-T2	570	47.33 ± 8.75	.33**	-.10*	-.25**	-		
	5. De-T2	570	3.95 ± 4.48	-.14**	.45**	.44**	-.14**	-	
	6. ASBI-T2	570	43.02 ± 11.64	-.16**	.44**	.59**	-.32**	.61**	-

Abbreviations: ASBI, adolescent student burnout inventory; CNS, connectedness to nature; De, depressive symptoms.

* $p < .05$.** $p < .01$.**TABLE 3** Fit indices of these tested models.

Model	χ^2/df	RMSEA	CFI	TLI	SRMR
Mediation model (all)	7.78	0.07	0.94	0.83	0.06
Reverse mediation model (all)	3.21	0.04	0.98	0.94	0.03
Reciprocity mediation model (all)	3.72	0.05	0.99	0.95	0.03
Mediation model (male)	5.47	0.09	0.93	0.75	0.07
Reverse mediation model (male)	2.76	0.06	0.97	0.90	0.05
Reciprocity mediation model (male)	3.10	0.06	0.97	0.88	0.04
Mediation model (female)	3.81	0.07	0.97	0.90	0.05
Reverse mediation model (female)	2.20	0.05	0.99	0.96	0.03
Reciprocity mediation model (female)	1.31	0.02	0.99	0.99	0.03

Abbreviations: CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker–Lewis index.

3.2 | Mediation analysis

Table 3 demonstrates the fit indices of all the models, showing that the fit indices are acceptable for all models except the mediator model for males.

Figure 2a–c presents the results of the mediation model, the reverse mediation model, and the reciprocity mediation model for the full data. Tables 4 and 5 present the path coefficients. In the mediation model, connectedness to nature at T1 significantly predicted depressive symptoms at T2 ($B = -0.11$, $p < .01$), and depressive symptoms at T1 positively predicted

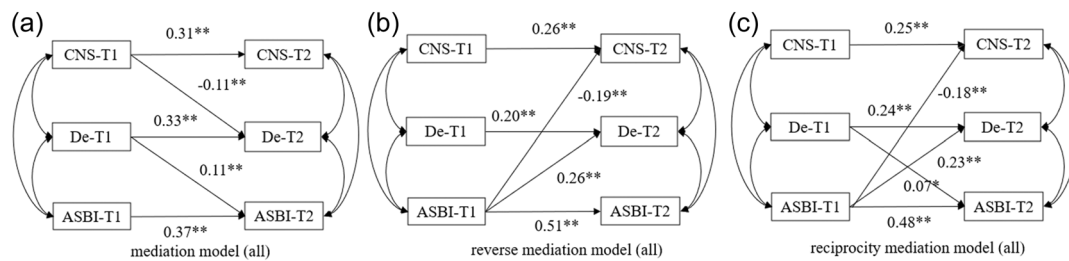


FIGURE 2 Results of tested models for the full data (a–c). * $p < .05$, ** $p < .01$. ASBI, adolescent student burnout inventory; CNS, connectedness to nature; De, depressive symptoms.

TABLE 4 Path coefficients for the mediation model for the full data.

Path	B	SE	p Value
Direct effect			
T1 CNS → T2 CNS	0.31	0.03	.00
T1 CNS → T2 De	−0.11	0.03	.00
T1 De → T2 De	0.33	0.03	.00
T1 De → T2 ASBI	0.11	0.03	.00
T1 ASBI → T2 ASBI	0.37	0.03	.00
Indirect effect			
CNS → De → ASBI	−0.01	0.00	.00

Abbreviations: ASBI, adolescent student burnout inventory; B, unstandardized coefficients; CNS, connectedness to nature scale; SE, standard error.

TABLE 5 Path coefficients for the reverse mediation model for the full data.

Path	B	SE	p Value
Direct effect			
T1 ASBI → T2 ASBI	0.51	0.03	.00
T1 ASBI → T2 De	0.26	0.03	.00
T1 De → T2 De	0.20	0.03	.00
T1 De → T2 CNS	−0.02	0.03	.62
T1 CNS → T2 CNS	0.26	0.03	.00
Indirect effect			
ASBI → De → CNS	−0.01	0.01	.51

Abbreviation: ASBI, adolescent student burnout inventory; B, unstandardized coefficients; CNS, connectedness to nature scale; De, depressive symptoms; SE, standard error.

learning burnout at T2 ($B = 0.11$, $p < .01$). The Sobel test showed that the indirect effect from CNS to ASBI via De was significant ($p < .01$).

For the reverse mediation model, learning burnout at T1 significantly predicted depressive symptoms at T2 ($B = 0.26$, $p < .01$), and learning burnout at T1 significantly predicted connectedness to nature at T2 ($B = -0.19$, $p < .01$). But depressive symptoms at T1 did not predict connection to nature at T2 ($B = -0.02$, $p > .05$). For the reciprocity mediation model, depressive symptoms and learning burnout were mutually predictive of each other, and learning burnout at T1 directly predicted connectedness to nature at T2 ($B = -0.18$, $p < .01$).

Figure 3a–c presents the results of the mediation model, the reverse mediation model, and the reciprocity mediation model for the male data. Figure 4a–c presents the results of the mediation model, the reverse mediation model, and the reciprocity mediation model for the female data. In the female sample, connectedness to nature at T1 significantly predicted depressive symptoms at T2 ($B = -0.08$, $p < .05$), and depressive symptoms at T1 positively predicted learning burnout at T2 ($B = 0.21$, $p < .01$). The Sobel test showed that the indirect effect from CNS to ASBI via De was insignificant ($p > .05$).

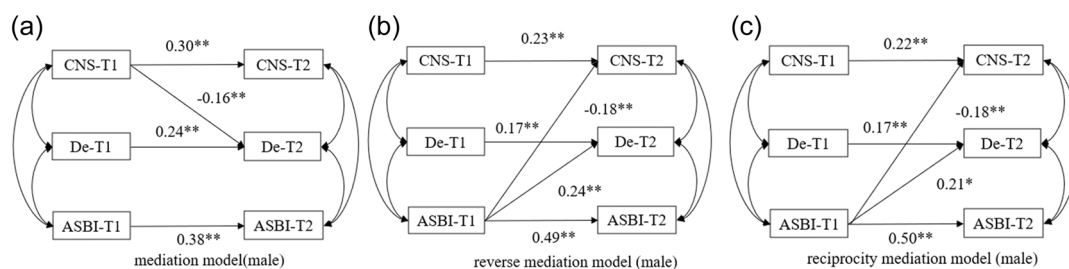


FIGURE 3 Results of tested models for the male data (a–c). ASBI, adolescent student burnout inventory; CNS, connectedness to nature scale; De, depressive symptoms.

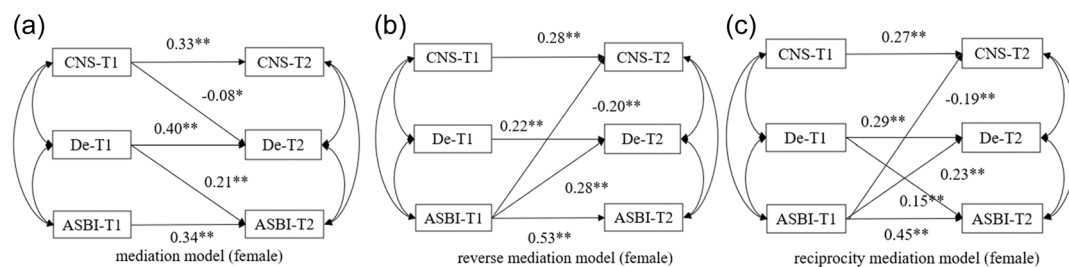


FIGURE 4 Results of tested models for the female data (a–c). ASBI, adolescent student burnout inventory; CNS, connectedness to nature scale; De, depressive symptoms.

4 | DISCUSSION

Following the COR and SRT, the present study examined the longitudinal relationships between connectedness to nature, depressive symptoms, and adolescent learning burnout. This study contributes to previous studies in two aspects. First, by expanding the resource loss to natural contact resources (i.e., connectedness to nature), this study investigated the longitudinal relationships among connectedness to nature, depressive symptoms, and adolescent learning burnout. Second, using the method of half-longitudinal mediation analysis, this study tested the mediation, reverse mediation, and reciprocity between connectedness to nature and adolescent learning burnout and development via the mediation of depressive symptoms. This study also discussed gender differences in the three models. The results of the current study indicated that connectedness to nature can serve as a positive resource to alleviate the levels of depressive symptoms among adolescents and thereby decrease learning burnout. However, the protective effect of connectedness to nature was smaller, and the decreasing effect of learning burnout on connectedness to nature was stronger than the alleviating effect of connectedness to nature on learning burnout. Additionally, the study found that depressive symptoms and academic burnout have a mutually reinforcing effect over time and that the effects of this interaction are more pronounced in females.

4.1 | Connectedness to nature, depressive symptoms, and learning burnout

The initial level of nature connectedness (T1) negatively predicted depressive symptoms at a later time point (T2), which was consistent with previous longitudinal studies (Flouri et al., 2014; Mueller et al., 2023). Natural spaces are healing environments, and teens who have a strong connection to nature are more likely to benefit from it and can help alleviate emotional problems. However, this path was only found in the mediation model. Contrary to our hypothesis, the initial level of nature connectedness (T1) did not have a negative predictive effect on depressive symptoms at a later time point (T2) in the reciprocity mediation model. We propose two possible explanations for this phenomenon. First, a meta-analysis of 35 studies on the relationship between nature engagement and mental health in children and adolescents reveals an inconclusive association between nature engagement and mental health (Tillmann et al., 2018). Previous studies also indicated that although the effect size of nature connectedness on individuals is statistically significant, the effect size is small (Capaldi et al., 2014; Mackay & Schmitt, 2019; Moens et al., 2019; Pritchard et al., 2019). Furthermore, these benefits may require repeated exposure to nature to be maintained (Jones et al., 2021; Shanahan et al., 2016). Second, based on the ecological model of adolescent development (Bronfenbrenner, 1979), individuals are influenced by various environmental systems and the dynamic interaction between these systems and the individual shape their development. These systems encompass the microsystem, mesosystem, exosystem,

macrosystem, and chronosystem, with the microsystem being the most influential level within the ecological systems theory. When considering adolescent mental health, it is noteworthy that microsystems such as schools, families, and peer groups may have a greater impact than the natural environment (Aldridge & McChesney, 2018; Han et al., 2023; Negriff, 2020). Therefore, it is plausible that the impact of the natural environment will be diminished even further, leading to a destabilizing effect on the predictive relationship between nature connectedness and adolescent depressive symptoms.

In addition, the findings provided support for a reciprocal relationship between depressive symptoms and adolescent learning burnout, aligning with the findings of Salmela-Aro et al. (2017). According to the COR, the depletion of resources tends to contribute to burnout in individuals (Hobfoll et al., 2015, 2018). Adolescents with higher levels of depressive symptoms have likely already exhausted a significant amount of psychological resources, leaving them with limited resources to cope with academic demands, thereby increasing the likelihood of experiencing learning burnout. Conversely, adolescents who are burnt out may experience a decline in their academic performance, and face heightened pressure to excel academically. The persistent stress experienced by these individuals further increases their vulnerability to developing depressive symptoms. Consequently, a harmful cycle emerges, perpetuating the interplay between depressive symptoms and learning burnout. It has also been found that girls are more susceptible to depressive symptoms, which can lead to school burnout. This may be due to the fact that compared to boys, girls show more severe manifestations of depressive symptoms such as anxiety levels, sleep disturbances, and feelings of hopelessness, which can easily affect girls' performance in school (Sun et al., 2023).

We also found that learning burnout can directly affect the connection to nature afterward. According to previous studies, students with academic burnout tended to rely on problematic behaviors to alleviate the burnout situation, such as mobile phone addiction and alcohol abuse (Del Carmen Pérez-Fuentes et al., 2021; Hao et al., 2022). This may tend to cause adolescents with academic burnout to directly reduce their connection to the external environment, which also includes the natural environment.

4.2 | The mediating role of depressive symptoms

Depressive symptoms mediated longitudinally between nature connection and academic burnout. This may suggest that if adolescents have less contact with the natural environment and their connection with nature declines, after which adolescents' mental health may decline, such as an increase in depressive mood, and this increased depressive state may further impair adolescents' performance in academics and academic burnout problems.

However, the path is not captured in the reciprocal mediation model. Although our findings do not fully support the mediation model (H1), it does not imply that nature connectedness does not have an impact on adolescent depressive symptoms and learning burnout. Piccininni et al. (2018) highlighted that the role of nature connectedness in relation to adolescents is weak and inconsistent, potentially due to variations in the significance of natural connections for adolescents. Moreover, the COR highlights that a resource's value is dependent on its importance to an individual (Halbesleben et al., 2014). Adolescents may be influenced by other resources that they consider more crucial. Additionally, the authors suggested that nature connectedness should be used as a protective factor for adolescents' mental health (Hakoköngäs & Puhakka, 2021; Piccininni et al., 2018; Wales et al., 2022). Therefore, this study supports the notion that a connection with nature does not determine adolescent depressive symptoms and learning burnout but rather has a protective effect.

4.3 | Limitations of the study and directions for future research

This study enhances our understanding of the interplay between connectedness to nature, depressive symptoms, and adolescent learning burnout. However, there are several limitations that warrant improvement. First, the study only collected data at two-time points and utilized a half-longitudinal analysis. This selected method of data analysis constrained our ability to determine whether the mediation effect was partial or complete (Sarmiento-Henrique et al., 2020). To capture a more comprehensive longitudinal relationship, it is recommended that future studies collect data at a minimum of three-time points for analysis. Second, the participants in this study primarily consisted of adolescents from middle-level cities in China, limiting the generalizability of the findings to a nationwide context. Therefore, future studies should strive to include a more diverse sample of participants. Lastly, this study heavily relied on self-reported data to measure the variables, introducing subjectivity. Subsequent studies could incorporate more objective measures in data collection.

5 | CONCLUSION

The findings of this study revealed the dynamic trajectory of nature connectedness, depressive symptoms, and their impact on adolescent learning burnout over time. Specifically, it was observed that depressive symptoms exhibited an unstable pattern, mediating the relationship between nature connectedness and adolescent learning burnout. Furthermore, the current

study highlights the protective role of nature connectedness and underscores the negative repercussions of learning burnout among adolescents.

Finally, against the backdrop of increasing learning pressure and psychological problems among adolescents, these findings remind us to pay more attention to the problem of learning burnout among children and adolescents, which may later affect their emotions and behaviors. This study also enriches the ways and means of intervening in children's and adolescents' mental health, and suggests that we should pay more attention to children and adolescents' nature contact, and that families, schools, and society should work together to provide a good environment for children and adolescents to have nature contact.

AUTHOR CONTRIBUTIONS

Rentao Zhang and Hui Chen were involved in the conception and design of the study, compilation, analysis, and interpretation of data, and drafting and editing of the manuscript. Li Liu and Fuming Wang contributed to the acquisition of data. Zhihui Yang contributed to the interpretation of data. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

The Ethical Committee of the Department of Psychology, Beijing Forestry University, China, approved this research. The informed consent was obtained from the participants and their parents.

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Interpersonal sensitivity, smartphone addiction, connectedness to nature and life satisfaction among college students: A moderated mediation model

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This study explored the relationship between interpersonal sensitivity and life satisfaction among college students, the mediating effect of smartphone addiction, and the moderating effect of connectedness to nature. A total of 702 college students (453 females, $Mean_{age} = 19.60$ years, $SD = 1.33$ years) completed the Interpersonal Sensitivity Scale, Mobile Phone Addiction Index, Connectedness to Nature Scale, and Satisfaction with Life Scale. Following moderated mediation analysis, the results showed that smartphone addiction mediated the relationship between interpersonal sensitivity and life satisfaction among college students. Furthermore, connectedness to nature did not moderate the relationship between interpersonal sensitivity and life satisfaction among college students, but it moderated the relationship between smartphone addiction and life satisfaction among college students. These findings identified both risk factors and protective factors that influence life satisfaction among college students, providing valuable guidance for enhancing their life satisfaction.

Keywords: interpersonal sensitivity, smartphone addiction, connectedness to nature, life satisfaction

Introduction

In the digital age, life satisfaction may depend on interpersonal sensitivity as people share online spaces more readily than in-person encounters. Interpersonal sensitivity is a personality trait about individual responsiveness to the emotions and behaviours of others (Boyce & Parker, 1989). Higher interpersonal sensitivity individuals tend to utilise smartphones to fulfil psychological needs (Kardefelt-Winther, 2014), which carries risks for smartphone addiction. Smartphone addiction, also known as mobile phone dependency or problematic mobile phone use, is characterised by excessive and compulsive phone usage that detrimentally impacts an individual's daily life (Lin et al., 2021; Lopez-Fernandez et al., 2014; Seo et al., 2016; You et al., 2019). Young college students may be most at risk as they spend a significant amount of time online. Their connectedness to nature may make a difference to young people's life satisfaction in the digital age. Connectedness to nature represents a profound relationship between individuals and the natural world. The relationship is manifested in people's emotional attachment to nature, cognitive integration with nature, and a desire to be present in and connected with nature (Li et al., 2018). We are not aware of any studies that examine the role of smartphone addiction and connectedness to nature in interpersonal sensitivity and life satisfaction among college students. Therefore, our study aimed to examine these relationships in the Chinese setting.

Interpersonal sensitivity and life satisfaction

People with high levels of interpersonal sensitivity may experience lower overall life satisfaction (Błachnio & Przepiórka, 2018). They tend to be easily hurt, misunderstand others' behaviour, possess limited social skills, exhibit low self-confidence, struggle with excessive anxiety, exhibit social avoidance, and experience feelings

of inferiority (Bilgin, 2020; Eraslan-Capan, 2015; Luo et al., 2021; Nyström et al., 2018; Otani et al., 2018; You et al., 2019). High interpersonal sensitivity may be associated with maladaptive coping strategies (Nyström et al., 2018), which would impede an individual's ability to achieve a high level of life satisfaction (Rodrigues et al., 2023).

Smartphone addiction as a mediator

The Internet environment offers anonymity, convenience, and escapism, providing individuals who face challenges in establishing or maintaining real-life relationships with increased opportunities for social interaction (Fan et al., 2022; You et al., 2019; Young, 2001). When their interpersonal relationship needs are not adequately met, college students often resort to their smartphones to fulfil their need for communication. The risk of smartphone addiction may be higher when online engagement stems from dissatisfactory needs fulfilment. Both cross-sectional and longitudinal studies consistently indicate a strong association between interpersonal sensitivity and internet addiction (Jang et al., 2008; Ko et al., 2007; Lin et al., 2020).

According to the Compensatory Internet Use Theory, smartphones serve as a significant medium for virtual social interactions, enabling individuals to anticipate and prepare for potential negative evaluations from their social environment (Marin & Miller, 2013). It can also prompt individuals to speculate about others' thoughts and to conform so as to avoid negative evaluations. Smartphone addiction also exhibits a negative correlation with life satisfaction. A cross-sectional study revealed that excessive smartphone use serves as a contributing factor to diminished life satisfaction (Fischer-Grote et al., 2021). Similarly, a longitudinal study conducted among Chinese college students to establish a causal link between smartphone addiction and life satisfaction demonstrated

that smartphone addiction negatively predicts life satisfaction among college students (He & Hui, 2019).

Connectedness to nature as a moderator

Nature can offer individuals a sense of safety and belonging, serving as an alternative form of support (Fan et al., 2022). A study found that individuals who experience social exclusion find solace in connecting with nature, thereby attaining a sense of belonging and acceptance, which enhances their positive experiences (Chen et al., 2023). Natural elements possess inherent stress-reducing properties that decrease the reactivity of the nervous system to stressors (Ulrich et al., 1991). While interpersonal sensitivity intensifies stress levels for individuals, connectedness to nature has the potential to alleviate that stress.

Smartphone usage draws heavily on an individual's cognitive resources (Gong & Liu, 2023). As these resources diminish, individuals experience an increase in negative emotions, subsequently impacting their life satisfaction (Proctor et al., 2009). Connectedness to nature can effectively restore individuals' cognitive resources (Kaplan, 1995). Additionally, individuals with high connectedness to nature encounter more natural settings (Hinds & Sparks, 2008), which prompt them to engage in necessary psychological cleansing, resolve persistent thoughts, and enhance positive emotional experiences (Wells et al., 2019).

Goal of the study

We aimed to examine the mediating effect of smartphone addiction and the moderating effect of connectedness to nature by constructing a moderated mediation model. Figure 1 presents our conceptual model of the moderated mediation model. In that regard, we proposed the following hypothesis for testing among college students:

Hypothesis 1: Interpersonal sensitivity significantly and negatively predicts overall levels of life satisfaction.

Hypothesis 2: Smartphone addiction mediates the relationship between interpersonal sensitivity and life satisfaction for lower life satisfaction.

Hypothesis 3: Connectedness to nature moderates the relationship between interpersonal sensitivity and life satisfaction for higher life satisfaction.

Hypothesis 4: Connectedness to nature moderates the relationship between smartphone addiction and life satisfaction for higher life satisfaction.

Methods

Participants

A total of 702 college students (453 females) participated in our survey. Specifically, the college student participants included: 195 (27.78%) first-year students, 182 (25.92%) sophomores, 208 (29.63%) juniors, and 117 (16.67%) seniors. The mean age of participants was 19.60 (SD age = 1.33).

Measures

The participants self-reported their demographic characteristics. Additionally, they completed the Interpersonal Sensitivity Scale (ISS: Derogatis et al., 1976), the Mobile Phone Addiction Index (MPAI: Leung, 2008), the Connectedness to Nature Scale (CtNS: Li & Wu, 2016), and the Satisfaction with Life Scale (SwLS: Leung & Leung, 1992). These are described next.

Interpersonal Sensitivity

The ISS (Derogatis et al., 1976) consists of 9 items. A sample item is: "Feeling shy or uneasy with the opposite sex." Items are scored on a 5-point Likert scale ranging from 0 = not at all, to 4 = all the time. Scores are summed, with a higher score being a stronger sense of interpersonal sensitivity. In the current study, the Cronbach's α for scores from the ISS was 0.90.

Smartphone Addiction

The MPAI (Leung, 2008) comprises 17 items that measure loss of control, complaints from others about the individual's behaviour, anxiety, obsessive behaviour, withdrawal or attempts to escape, and productivity loss. A sample item is: "You're too busy using your phone to do other things and cause problems." Items are scored on a 5-point Likert scale ranging from 1 = not at all, to 5 = all the time. Scores are summed, with a higher score indicating a stronger smartphone addiction. In the current study, the Cronbach's α for scores from the MPAI was 0.92.

Connectedness to Nature

The CtNS (Li & Wu, 2016) consists of 14 items. A sample item is: "The earth belongs to me, and I belong to the earth." Items are scored on a 5-point Likert scale ranging from 1 = strongly disagree, to 5 = strongly agree. Scores are summed, with a higher score indicating a greater degree of connectedness to nature. In the current study, the Cronbach's α for scores from the CtNS was 0.81.

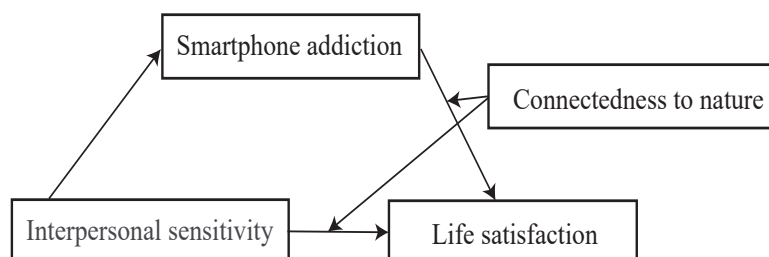


Figure 1. The conceptual model of the moderated mediation model

Life Satisfaction

The SwLS (Leung & Leung, 1992) consists of 5 items. A sample item is: "I am satisfied with my life." Items are scored on a 7-point Likert scale ranging from 1 = strongly inconsistent, to 7 = strongly consistent. Scores are summed, with a higher score indicating the student is more satisfied with their life. In the current study, the Cronbach's α for scores from the SwLS was 0.90.

Control variables

The participants self-reported their demographic characteristics, including grade, sex, and age. For this study, we considered the age and sex of participants as control variables during the analyses.

Data analysis

Data were analysed utilising the SPSS 24.0 software. All variables were standardised. We used Model 4 to explore the mediating effect of smartphone addiction and Model 15 to carry out a moderated mediation model to explore the moderating effect of connectedness to nature using PROCESS macro 3.2 (Hayes & Rockwood, 2020). Moreover, the bootstrap approach with 5 000 resamples to estimate the 95% confidence interval (CI) was conducted for interpreting the significance of indirect effects. To account for potential confounding effects, demographic factors – specifically age and sex – were considered priori covariates in the analysis.

Harman's single-factor test was conducted to test for common methods bias. Harman's single-factor test found that a total of 10 factors had eigenvalues greater than 1 and the first variance explanation rate was 24.67%, which is less than the critical value of 40%, indicating no significant common method bias in this study (Zhou & Long, 2004). Findings from observed scale characteristics indicated that kurtosis scores were between -0.584 and 1.069, and skewness values ranged from -0.617 to 0.356, indicating that all measures had relatively normal distribution (Table 1) (D'agostino et al., 1990; Kline, 2015).

Results

Descriptive statistics and correlation analysis of all variables

Table 1 presents the descriptive statistics and correlation matrix for the study variables. Interpersonal sensitivity showed a positive correlation with smartphone addiction ($r = 0.582, p < 0.001$), a negative correlation with life

satisfaction ($r = -0.407, p < 0.001$), but the correlation between interpersonal sensitivity and connectedness to nature was not significant ($r = -0.071, p > 0.05$); Smartphone addiction showed a negative correlation with life satisfaction ($r = -0.351, p < 0.001$), but the correlation between smartphone addiction and connectedness to nature was not significant ($r = 0.041, p > 0.05$); Life satisfaction showed a positive correlation with connectedness to nature ($r = 0.167, p < 0.01$). The correlation coefficients between any two of the three variables were lower than 0.8, which indicates that a low-to-moderate correlation existed between the variables, and no collinearity was observed (Benesty et al., 2009).

Testing for mediating effect of smartphone addiction

The result showed interpersonal sensitivity significantly and negatively predicted life satisfaction ($\beta = -0.411, p < 0.001$). This result supported Hypothesis 1 that higher interpersonal sensitivity significantly predicted lower levels of life satisfaction.

Model 4 was employed to examine the mediating effect of smartphone addiction between interpersonal sensitivity and life satisfaction, while controlling for sex and age. The results revealed that interpersonal sensitivity significantly and positively predicted smartphone addiction ($a = 0.581, SE = 0.031, p < 0.001$). In the regression equation, both interpersonal sensitivity and smartphone addiction simultaneously predicted life satisfaction. Specifically, interpersonal sensitivity significantly and negatively predicted life satisfaction ($c' = -0.311, SE = 0.042, p < 0.001$), while smartphone addiction also significantly and negatively predicted life satisfaction ($b = -0.171,$

$SE = 0.042, p < 0.001$). The results indicated a significant mediating effect of smartphone addiction between interpersonal sensitivity and life satisfaction ($ab = -0.100, Boot SE = 0.025, 95\% CI = [-0.151, -0.051]$). The proportion of the total effect accounted for by the mediating effect was 24.33%. These results supported Hypothesis 2, which proposed that smartphone addiction mediated the relationship between interpersonal sensitivity and life satisfaction for lower life satisfaction.

Testing for moderating effect of connectedness to nature

Model 15 was utilised to examine the moderating effect of connectedness to nature on the direct path (the impact of interpersonal sensitivity on life satisfaction) and on the latter path of this mediating process (the impact

Table 1. Descriptive statistics and correlation results

	M	SD	Skewness	Kurtosis	α	1	2	3	4
1. Interpersonal sensitivity	2.26	0.83	0.356	-0.584	0.903	1			
2. Smartphone addiction	2.85	0.78	0.135	-0.245	0.917	0.582***	1		
3. Life satisfaction	4.08	1.37	-0.098	-0.477	0.898	-0.407***	-0.351***	1	
4. Connectedness to nature	3.60	0.56	-0.617	1.069	0.814	-0.071	0.041	0.167**	1

Note. *** $p < 0.001$, ** $p < 0.01$

of smartphone addiction on life satisfaction). The test comprised parameter estimation for two regression equations. The first equation estimated the predictive effect of interpersonal sensitivity on smartphone addiction, while the second equation estimated the predictive effects of interpersonal sensitivity, smartphone addiction, connectedness to nature, the interaction between connectedness to nature and interpersonal sensitivity and the interaction between connectedness to nature and smartphone addiction on life satisfaction. According to Table 2, the following findings were observed: (1) Interpersonal sensitivity had a significant main effect on smartphone addiction; (2) There was a significant main effect of interpersonal sensitivity on life satisfaction, but the interaction between interpersonal sensitivity and connectedness to nature was not significant; (3) There was a significant main effect of smartphone addiction on life satisfaction, and the interaction between smartphone addiction and connectedness to nature was significant. These research findings met the criteria of a moderated mediation model (Wen & Ye, 2014). These findings did not support Hypothesis 3, but supported Hypothesis 4. The moderating role of connectedness to nature in the mediating path was further examined using the index of moderation provided by the Process software. The results indicated that the index of moderation was -0.070 (95% CI = [-0.121, -0.020]). Since the CI did not include zero, it suggests a significant moderated mediation effect. Specifically, the latter path of the mediating effect of “interpersonal sensitivity → smartphone addiction → life satisfaction” was moderated by connectedness to nature. These results supported Hypothesis 4, which proposed that connectedness to nature moderates the relationship between smartphone addiction and life satisfaction for higher life satisfaction.

In order to reveal how connectedness to nature mediates the impact of smartphone addiction on life satisfaction, this study conducted a simple slope test. The total score of connectedness to nature was divided into high and low groups according to the mean score plus or minus one standard deviation for difference testing. As shown in Figure 2, we can conclude that in the low connectedness to nature group, the predictive effect of smartphone addiction on life satisfaction is not significant ($B_{\text{simple}} = -0.059$, $SE = 0.061$, $p > 0.05$). Regardless of whether individuals have high or low levels of smartphone addiction, their life satisfaction levels are significantly lower than the mean. In the high connectedness to nature group, the negative predictive effect of smartphone addiction on life satisfaction is highly significant ($B_{\text{simple}} = -0.299$, $SE = 0.059$, $p < 0.001$). This suggests that individuals with high connectedness to nature and high levels of smartphone addiction have lower life satisfaction. However, individuals with high connectedness to nature and low levels of smartphone addiction can maintain higher life satisfaction. These results indicate that connectedness to nature plays a significant moderating role in the predictive effect of smartphone addiction on life satisfaction. The specific moderating pattern is as follows: in the case of low smartphone addiction, connectedness to nature can buffer the impact of smartphone addiction on individuals' life satisfaction. However, as smartphone addiction levels increase, the buffering effect of connectedness to nature on the risk of smartphone addiction gradually weakens and disappears, which again supports Hypothesis 4.

Discussion

Our findings revealed that smartphone addiction plays a partial mediating effect in the relationship between interpersonal sensitivity and life satisfaction among college students. As interpersonal sensitivity increases,

Table 2. Moderated mediation model

Independent variables	Model 1 (Criterion: Smartphone addiction)			Model 2 (Criterion: Life satisfaction)		
	β	SE	<i>t</i>	β	SE	<i>t</i>
Sex	0.111	0.064	1.732	-0.131	0.070	-1.871
Age	-0.025	0.023	-1.100	-0.029	0.025	-1.159
Interpersonal sensitivity	0.581	0.031	18.899***	-0.278	0.041	-6.711***
Smartphone addiction				-0.179	0.041	-4.335***
Connectedness to nature				0.133	0.035	3.818**
Interpersonal sensitivity × Connectedness to nature				-0.031	0.044	-0.699
Smartphone addiction × Connectedness to nature				-0.121	0.043	-2.801**
<i>R</i>	0.585			0.492		
<i>R</i> ²	0.343			0.242		
<i>F</i>	121.233***			31.594***		

Note. *** $p < 0.001$, ** $p < 0.01$.

individuals may exhibit social avoidance due to heightened concern about others' opinions and evaluations of them (Stavropoulos et al., 2022). Consequently, individuals become more reliant on smartphones as a communication tool, thus increasing the risk of smartphone addiction (Marin & Miller, 2013). Similarly, individuals who struggle with face-to-face relationship skills tend to compensate for their social deficiencies by seeking lower-demand online relationships (Stavropoulos et al., 2022). Individuals with high interpersonal sensitivity often exhibit low self-efficacy in real social interactions. Such individuals tend to adopt the "ideal identity" they themselves have constructed to socialise in online interactions. "Ideal identity" can lead to a temporarily positive experience for individuals. Therefore, their dependence on existing online social relationships increases their risk of smartphone addiction (Li et al., 2008).

On the other hand, individuals with smartphone addiction become completely absorbed in the information provided by their phones, which demands the recruitment of more cognitive resources. The most obvious cost of this addiction is their emotional health problems. From an emotion regulation perspective, individuals with high smartphone addiction will have lower self-control (Geng et al., 2021), which will directly affect their emotional regulation and their emotional balance (Paschke et al., 2016). Lower levels of emotional balance increase negative emotions and subsequently impact life satisfaction.

From an emotional expression perspective, individuals with high smartphone addiction tend to experience deficits in emotional expression and reflect deficiencies in emotional cognition and regulation (Squires et al., 2021). Inadequate emotional expression and unmet emotional needs result in negative life events and ultimately reduce life satisfaction. Therefore, when individuals' interpersonal sensitivities perceive that their relational needs are not met, they seek the most convenient means of fulfilling these needs, which increases the risk of smartphone addiction. As smartphone addiction intensifies, individuals' life satisfaction declines.

Our study found that connectedness to nature has no moderating effect in the relationship between interpersonal sensitivity and life satisfaction among college students. We speculate that individuals with high interpersonal sensitivity exhibit characteristics such as low self-esteem, social avoidance, and excessive anxiety, which are stable traits (Bilgin, 2020; Eraslan-Capan, 2015; Luo et al., 2021; Nyström et al., 2018; Otani et al., 2018; You et al., 2019). The stress-reducing effects obtained through connecting with nature are insufficient to eliminate fixed patterns of negative behaviour and thinking. Although connectedness to nature can enhance individuals' sense of connection, the social relationship needs of individuals may not align with the natural relationship needs brought about by connectedness to nature. Connectedness to nature cannot fully replace the function of social connections (Zhao et al., 2023), indicating that the temporary stress reduction obtained from nature cannot effectively buffer the negative effects of interpersonal sensitivity (Moreton et al., 2019).

We found connectedness to nature has a moderating effect in the relationship between smartphone addiction and life satisfaction among college students, which suggests that connectedness to nature can buffer the negative impact of smartphone addiction on life satisfaction. With access to the Internet, smartphones increasingly consume students' cognitive resources in various ways (Liu et al., 2017). Higher levels of connectedness to nature are beneficial for restoring students' cognitive resources. Students are better able to regulate their own resources to enhance self-control and reduce temptations. Additionally, connectedness to nature can trigger changes in individual emotion regulation (Johnsen & Rydstedt, 2013), block negative thoughts and elicit positive emotions (Li et al., 2018), both of which are important for improving their quality of life.

Implications for research and practice

This study has some important implications. Firstly, interpersonal sensitivity negatively impacts college students' life satisfaction. Therefore, it is worth considering reducing interpersonal sensitivity as a preventive and improvement measure to enhance their quality of life.

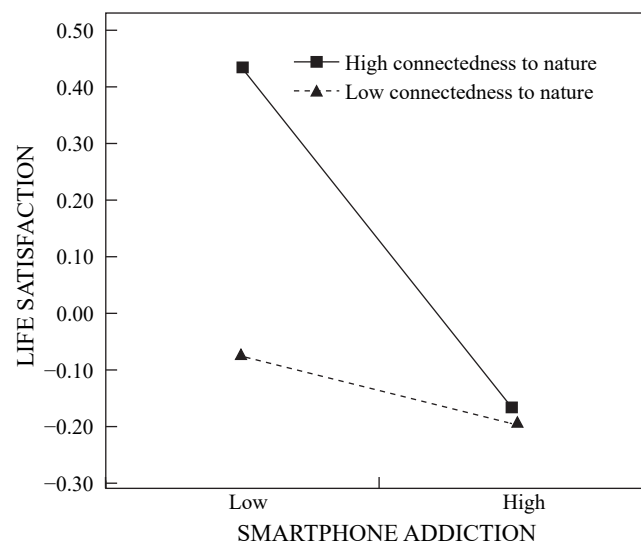


Figure 2. The effect of connectedness to nature and smartphone addiction on life satisfaction

Secondly, considering the mediating role of smartphone addiction, elevating the level of life satisfaction among college students can be achieved by targeting the reduction of smartphone addiction as a risk factor. For instance, interventions involving increased physical exercise and reading have effects on inhibitory control among college students with mobile phone addiction (Zhou & Wang, 2022). Lastly, these study findings suggest that efforts should be made to enhance college students' level of connectedness to nature, as it will be beneficial for improving their levels of life satisfaction.

Limitations and future recommendations

There are some drawbacks to consider in the current study. First, this was a cross-sectional research design study, which does not allow for causal relationship claims. Second, the method of convenience sampling used in this study may limit the generalisability of the findings. Future studies should employ longitudinal design and a probability sample for more definitive results. Moreover, this study only explored the mechanism of the relationship between the trait factor of interpersonal sensitivity and life satisfaction of college students from the perspective of interpersonal relationships. Other important psychological variables in interpersonal relationships (such as interpersonal distress and solitary behaviour), and college students' life satisfaction, are also worth exploring in future research.

Conclusion

This study analysed the relationship between interpersonal sensitivity, smartphone addiction, connectedness to nature, and life satisfaction among college students. Our study shows that interpersonal sensitivity is associated with decreased life satisfaction and higher smartphone dependency. Connectedness to nature plays a moderating effect in the relationship between smartphone addiction and life satisfaction among college students. This study highlights the negative effects of interpersonal sensitivity and smartphone addiction, as well as the protective role of connectedness to nature and suggests potential interventions to mitigate these effects. These findings identify both risk factors and protective factors that influence life satisfaction among college students, providing valuable guidance for student support programmes aimed at enhancing their life satisfaction.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ethics approval statement

The study was performed in accordance with the Declaration of Helsinki. This study was granted approval by the Ethics Committee of Hebei Normal University. The researchers informed the participants of the purpose of this research. Individuals who signed the informed consent form were allowed to participate in the study.

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社会责任感对青年亲社会行为的影响： 积极情绪的中介作用和社会阶层的调节作用

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【摘要】 目的:考察社会责任感对青年亲社会行为的预测作用及其内在机制,探讨积极情绪的中介作用和社会阶层的调节作用。**方法:**采用社会责任感量表、亲社会倾向量表和积极情绪量表对北京市1808名青年(18~35岁)进行问卷调查,同时被试报告主观社会阶层。**结果:**(1)社会责任感正向预测青年的亲社会行为;(2)积极情绪在社会责任感对青年亲社会行为的影响过程中起部分中介作用;(3)社会阶层在社会责任感对青年亲社会行为的影响过程中起调节作用,社会阶层越高,社会责任感、积极情绪对青年亲社会行为的正向预测作用越强。**结论:**社会责任感对青年的亲社会行为既有直接预测作用,也可以通过积极情绪起间接预测作用,高社会阶层可以增强社会责任感和积极情绪对亲社会行为的积极影响。

【关键词】 社会责任感; 亲社会行为; 积极情绪; 社会阶层; 青年

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Social Responsibility and Youths' Prosocial Behavior: The Mediating Effect of Positive Affect and the Moderating Effect of Social Class

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【Abstract】 Objective: To investigate the impact of social responsibility on youths' prosocial behavior and the mediating role of positive affect and the moderating role of social class on this relationship. **Methods:** A total of 1808 participants in Beijing (age from 18~35) were tested by Social Responsibility Scale, Prosocial Tendency Measurement Scale, Positive Affect Scale and self-reported social class. **Results:** (1) Social responsibility positively predicted youths' prosocial behavior; (2) Positive affect served as the mediating mechanism that accounted for the effect of social responsibility on youths' prosocial behavior; (3) Social class moderated the direct and indirect paths between social responsibility and youths' prosocial behavior. Social class enhanced the positive effect of social responsibility and positive affect on youths' prosocial behavior. **Conclusion:** Youth's sense of social responsibility directly predicted prosocial behavior and also indirectly exerted a positive effect on prosocial behavior through positive affect. High social class enhanced the positive influence of youth's sense of social responsibility and positive affect on prosocial behavior.

【Key words】 Social responsibility; Prosocial behavior; Positive affect; Social class; Youth

亲社会行为(prosocial behavior)指个体做出的符合社会期望、对他人或集体有益的行为^[1],包括合作、捐款、互助以及为维护正义、反对暴力而对破坏社会规则的个体或群体实施的利他性惩罚等^[2]。亲社会行为对个体维持良好的人际关系和社会声誉^[3-5],以及人类社会事业发展均具有积极作用^[6]。以往研究重点关注儿童与青少年的亲社会行为^[7,8],较少涉及青年群体,探讨青年亲社会行为的影响因素,对于促进青年的亲社会行为具有重要意义。

社会责任感与亲社会行为可能具有密切关联。社会责任感(social responsibility)是个体以利他出发点,愿意为社会及社会成员的共同利益而维护社会规范的态度和行为倾向^[9]。根据规范激活理论,个

人规范在相应的情境中得到激活,个体便能做出亲社会行为^[10]。社会责任感越强的个体受社会规范的影响更深刻,更容易形成符合社会规范的个人规范^[11,12],从而更有可能做出亲社会行为。而且,根据亲社会行为的认知-脑神经回路模型,负责社会规范表征的区域通过使个体遵守社会规范、进行自我控制等途径影响亲社会行为决策^[12]。社会责任感与社会规范表征过程高度相关,因此,社会责任感可能对亲社会行为有重要影响。但目前缺乏直接研究考察社会责任感与亲社会行为之间的关系及机制。

积极情绪(positive affect)代表个体内心愉悦、快乐的主观体验^[13],与亲社会行为联系紧密^[14-16]。根据亲社会行为的认知-脑神经回路模型,当个体意识到亲社会行为能够带来回报(如物质回报、社会性奖励)时,奖赏预期系统即被激活产生奖赏体验,从而

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促进个体做出亲社会行为^[12]。奖赏任务能够诱发被试的积极情绪^[17]。因此,积极情绪可能作为奖赏体验中的重要成分,鼓励个体主动与他人建立联系^[18],激励个体做出更多亲社会行为。以往研究发现,积极情绪在社会责任感和求职行为之间起中介作用,社会责任感越高,个体越能够获得他人信任与认可,从而得到更多资源支持,体验到更多积极情绪^[19]。因此,本研究假设,积极情绪可能在社会责任感与亲社会行为之间起到中介作用。

亲社会行为不完全取决于行动者的个人特征,还会同时受到个体所拥有的时间、金钱等资源的约束^[20]。社会阶层(social class)能在很大程度上反映个体所持资源的数量及质量^[21]。社会阶层可指客观社会阶层或主观社会阶层,后者指个体感知到的自己在社会中的相对位置^[22]。相比于客观社会阶层,主观社会阶层与个体的情绪和行为关联更强^[23,24],因此本研究主要聚焦主观社会阶层的影响。有研究指出,高社会阶层的个体拥有更多的可支配资源^[5],他们的行为较少受到资源的限制,做出的亲社会行为也更多^[25,26]。因此,在社会责任感和亲社会行为的关系中,社会阶层高和低的个体可能有着不同的表现,提示社会阶层可能发挥一定的调节效应。比如社会阶层高时,个体的社会责任感和积极情绪水平越高,在充沛的资源条件下,可能更容易做出亲社会行为。而当社会阶层低时,即使个体有较强的社会责任感或积极情绪,但由于资源限制,可能亲社会行为的倾向并不会明显提高。但是,以往研究较少探索社会阶层在亲社会行为方面的调节作用。实际上社会阶层较为稳定、不易改变,即使在操纵后发生变化也只是暂时性的^[27]。因此,将其作为调节变量看待更有利于研究者未来针对不同社会阶层的青年差异化地进行干预以促进其亲社会行为。综上,本研究将以青年群体为研究对象,探讨社会责任感对亲社会行为的影响,提出的假设模型如图1所示。

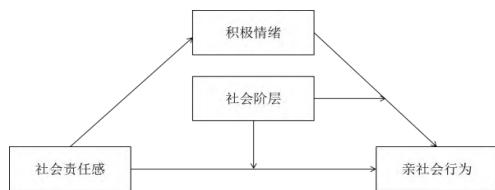


图1 变量关系模型

1 对象与方法

1.1 研究对象

选取北京市18~35岁的青年进行网络问卷调

查,通过问卷星平台发放并收集问卷2204份。剔除无效问卷后,保留有效问卷1808份,问卷有效回收率为82.03%。其中,男性1027名,女性781名,平均年龄为25.91±5.21岁。

1.2 研究工具

1.2.1 社会责任感量表 采用田园编制的社会责任感量表^[28]。该量表共28题,从国家、集体和家庭三个维度测量社会责任感。采用5点计分,从1(表示“完全不符合”)到5(表示“完全符合”),总分越高,被试社会责任感越强。本研究中该量表的Cronbach's α 系数为0.88。

1.2.2 亲社会倾向量表 采用Carlo和Randall编制、丛文君修订的亲社会倾向测量问卷^[29,30]。该量表共23题,从利他、依从、情绪、匿名、公开和紧急六个维度测量亲社会倾向。采用5点计分,从1(表示“完全不符合”)到5(表示“完全符合”),总分越高,被试亲社会行为越多。本研究中该量表的Cronbach's α 系数为0.92。

1.2.3 积极情绪量表 采用Watson等人编制、邱林等人修订的积极-消极情绪量表^[31]。该量表由描述积极情绪和消极情绪的词语(各9个)组成,测量被试积极和消极情绪的程度。采用5点计分,1~5分代表强度从“非常轻微或根本没有”到“非常强烈”。本研究采用积极情绪题目,总分越高,被试体验到的积极情绪水平越高。本研究中积极情绪量表的Cronbach's α 系数为0.92。

1.2.4 社会阶层 本研究用一道题目测量被试的社会阶层。题目为“您认为自己属于社会的哪个阶层?”采用5点计分,1代表最低层,5代表最高层,得分越高表示被试认为自己的社会阶层越高。

2 结果

采用SPSS 26.0进行数据整理和统计分析,包括共同方法偏差检验、描述统计以及相关分析。采用SPSS宏程序PROCESS 4.2依据假设模型进行中介和调节作用分析。

2.1 共同方法偏差检验

采用Harman单因素检验法对本研究收集的数据进行共同方法偏差检验。结果显示,第一个公因子解释了方差的22.46%,小于临界标准40%^[32],表明本研究不存在严重的共同方法偏差。

2.2 描述性统计及相关分析

对本研究变量关系模型中的四个变量进行相关分析。由表1可知,社会责任感、亲社会行为、积极

农林专业研究生心理健康影响因素与对策的分析

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摘要: 众多调查研究表明,农林专业研究生的心理健康水平显著低于全国研究生的平均水平。随着研究生规模的不断扩大,农林专业研究生面临着更大的压力,心理健康问题愈发严重,所以探讨农林专业研究生心理问题成因及对策具有重要意义。通过对农林专业研究生的心理健康现状、心理问题的产生原因等进行总结与分析发现,影响农林专业研究生心理健康水平的主要因素有经济压力、科研压力、就业压力、人际交往压力、研究生自身的不良特质等。为此,针对问题所在,提出提高农林专业研究生心理健康水平的对策。一是全面宣传国家的奖助政策,加大农林专业研究生的奖助力度,以缓解经济压力和部分人际交往压力。二是结合思政教育,引领农林专业研究生积极心理品质的培养,以应对科研压力。三是制定向农林学科专业倾斜的就业扶持政策,通过加强专业科普宣传教育、深化课程改革、组织专业性交流活动等,转变学生的就业观念和提高专业认同水平;通过加强职业生涯规划教育和指导以及提高职业生涯规划服务的专业性等,提高学生职业规划的科学性,以应对就业压力。四是通过面向全体研究生构建心理健康服务网状格局、开设心理健康教育课程、建立网络心理健康教育平台、建设自上而下的心理健康教育管理系统、提升研究生导师的综合素质、着力改善师生关系、建立家校联系制度等,完善心理健康教育服务体系,以提升农林专业研究生的心理健康水平。五是重视情感教育,通过尊重并满足学生的情感需要、培养道德情感和审美情感等高层次情感素质,加强积极情感的培养等,提升学生的情感素质水平。

关键词: 研究生教育;农林专业;心理健康;影响因素;对策;课程;职业生涯规划;导师;情感教育

我国高校的心理健康教育起步于20世纪80年代,党和国家给予了高度重视,为提高大学生心理健康水平提供了充分的政策支持^[1]。近年来,高校的心理健康教育不断深入,国家和学校也愈加重视研究生的心理健康问题,2010年出台的《教育部关于进一步加强和改进研究生思想政治教育的若干意见》^[2],2016年出台的《高校思想政治工作质量提升工程实施纲要》,都对包括大力促进心理育人在内的新时代研究生德育工作提出了更高的要求。在建设社会主义现代化国家的新时期,关注研究生心理健康问题,提高研究生心理健康水平,是为我国社会主义现代化建设培养高质量人才的重要前提^[3]。

随着年龄增长和学习阶段任务的变化,研究生比本科生承受着更大的学术、就业、经济以及婚育压力^[4]。已有多项研究表明,相较于高校本科生,研究生心理健康状况更加严峻。在一项关于研究生心理健康水平的调查研究中,研究者针对北京某“985”高校在读硕士和博士研究生进行调查发现:硕士研究生中有19.53%的学生认同“心情经常比较郁闷”、25.9%的学生认同“自己经常无端感觉烦躁”、33.4%的学生认同“当前压力越来越大”;而且博士研究生认同以上几个选项的比例均高于硕士生^[5]。另外一项对某高校4837名研究生进行的有关自杀

意图的调查发现,有15.4%的研究生存在自杀意图^[6]。这些调查结果均表明研究生心理健康问题不容乐观,而且有一部分研究生存在严重的心理问题,甚至是自杀风险。

在不同学科专业的研究生中,农林类专业研究生受学科差异和行业特殊性等因素的影响,面临的各种压力较大、较复杂,与其他专业研究生相比有着不同的心理特点。已有研究表明,农林专业研究生的心理健康水平低于非农林专业研究生。例如:刘丽萍等将北京市部分高等农林院校(北京林业大学、中国农业大学、北京农学院等)农林专业研究生心理健康状况调查结果与全国常模进行比较发现:测评量表中的各因子,除躯体化因子和人际关系因子外,农林专业研究生的其他因子测评值均高于全国成人常模,其中林学院研究生心理健康状况因子呈阳性的样本比例达到了63.16%,心理状态相对较差^[7]。又如西北农林科技大学对本校研究生进行的心理健康调查结果显示:农科研究生抑郁心理得分显著高于总体均值1.14分,且与其他专业相比,其心理健康测评总分大于等于160分的人数最多^[8]。

除此之外,根据《2020年国民经济和社会发展统计公报》,2020年在学研究生人数为314.0万人^[9],是

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1995 年在学研究生人数(14.5 万人)的 21.66 倍,研究生数量急剧增长。研究生招生规模的扩大在为学子带来更多深造机会的同时,也在一定程度上影响到生源质量以及学习竞争的强度^[10]。特别是教育部的统计数据显示,农学研究生在读人数已从 2010 年的 45 273 人增长至 2019 年的 125 839 人^[11]。这势必对农林专业研究生的求学、科研、就业等带来更大压力。因此,对农林专业研究生心理健康问题的成因、干预及预防等问题进行深入探讨是十分必要的。

一、农林专业研究生心理健康的影响因素

由于农林专业研究生主要学习的是农林专业知识和相关技能,所以相当一部分农林专业研究生毕业后选择从事与本专业相关的工作,服务于农林行业。然而,虽然当前农林业随着科学技术的快速发展正处于转型期,但是人们对农林业“面朝黄土、背朝天,靠天吃饭”的刻板印象仍难以消除,在大众眼里,农林业是艰苦的象征^[12]。即便近几年来随着“绿色环保”理念的兴起和获得广泛共识以及生态文明建设的不断推进,社会公众对农林学科的态度有了一定程度的改观,但是农林专业研究生的就业现状依旧十分严峻。

同时,由于农林行业具有工作条件艰苦、回报周期长、从业员工工资水平普遍不高等特点,所以其他学科专业的学生一般不愿选择报考农林科研究生,而农林专业本科生则会选择转专业、报考其他专业的研究生,或者只报考重点高校的农林科研究生,这造成农林科研究生生源数量与其他学科专业相比多有不足^[13]。而且很多本科生之所以选择农林学科专业进行深造,是因为不仅教育成本低且研究生录取分数较低、竞争较小。可见,学生更多考虑的是继续升学的成本和成功升学的概率,希望研究生学历能够使自己在较狭窄的职业选择范围内占据优势^[14-15]。此外,还有一些学生以未来进入劳动力市场的预期收益为读研的主要动因^[16]。

上述这些社会现象和存在的问题造成许多农林专业研究生缺乏浓厚的学术研究兴趣以及对人生目标和生命价值的实现深感迷茫。此外,农林专业研究生在各方面面临的问题与本科生已有很大差别^[17]。因此,在整个研究生教育阶段,与其他专业相比,农林专业研究生具有不同的学习生活方式以及价值观,也会具有独特的心理特点。归纳起来,农林专业研究生的心理健康主要受到经济、科研、就业、人际交往、自身特质等因素的影响。

(一)经济压力

大多数报考农林专业研究生的学生都来自农村或乡镇。以浙江农林大学为例,其 25 个硕士学位授权点包括生态学、风景园林学、农业硕士、林业硕士等,其中约 70% 以上的硕士点属于农林类学科。田海涛等人通过对浙江农林大学研究生生源进行调查发现:研究生生源大多来自农村,在校研究生中的经济困难生比例占总数的 21.83% 左右,新生入学时初次认定为经济困难生的比例在 30% 以上^[18]。另有一项针对湖南农业大学、中南林业科技大学、湖南人文科技学院农林专业研究生的调查显示,3 所学校的农林专业研究生有 60% 以上来自乡镇和农村^[19]。因此,农林专业研究生的经济状况普遍不佳,有的需要申请学校资助才能顺利完成学业。

与此同时,有研究对不同学科专业研究生获得资助情况进行调查发现:虽然农林专业是公共收益高于私人收益的专业,但农林专业研究生获得的资助却处于较低水平,平均资助水平显著低于理工科和人文类专业,且资助总量也较低。而且通过计算不同学科研究生的教育负担成本净价格发现,农林学科的教育负担成本净价格处于较高水平。这意味着农林专业研究生即使得到一定的经济资助,还是需要负担较高的教育成本,与理工科的教育负担成本净价格为负值形成鲜明的对比^[20]。

较低的资助水平与较高的教育成本负担会导致农林专业研究生出现生活困难的情况,再加上家庭无法给予充分的支持、学校又缺少针对农林专业研究生的资助政策,所以一些学生面临着较大的经济压力。这会造成学生出现心理健康问题,在焦虑、抑郁、人际关系敏感等方面表现得尤为突出,而长时间的消极情绪会进一步导致学生产生严重的心理困扰。特别是有些农林专业研究生会认为自己本应本科毕业就参加工作以缓解家庭经济紧张的,而读研则给家庭经济增添了额外的负担,所以在心理上觉得愧对家庭和父母。这些学生通常对自己要求更为严格,内心也更敏感脆弱^[21]。

此外,有些农村生源的农林专业研究生受成长过程中生活环境和生活方式的局限,会认为自己眼界不够开阔,从而产生自卑心理,在与他人交往时会更加敏感,容易封闭自我。

(二)科研压力

有研究指出,科研压力对研究生焦虑心理会产生显著正向影响,科研资源分配不公、过高的科研目标等压力源都会导致个体出现焦虑感、挫折感、愤怒

感等消极的情绪反应^[22]。当前,各高校对研究生毕业的标准、论文发表的数量等都有严格的规定,研究生需要投入大量的时间和精力才能完成一篇高质量的论文。在这一过程中,种种不确定因素的累加会使学生长期处于紧张状态,难以放松,从而容易出现强迫症等心理问题。

与其他学科专业的研究生相比,农林专业研究生面临的科研压力还有其特殊性。一是除了平时的课程学习之外,农林专业研究生还要参加许多任务繁重的课题研究,如在实验室处理样品进行实验,一个实验可能会持续十几个小时甚至几天;或进行野外实验时,可能要经常应对恶劣的野外环境等。久而久之,人烟稀少、生活艰苦、与外界的信息隔绝或联系不畅等恶劣的野外环境难免会使学生产生孤独、恐惧的心理。二是研究领域的特殊性以及研究材料的季节性等使农林学科专业研究生的科研周期更长,经常需要几个月甚至一年才能获得研究结果,甚至有的实验一旦失败研究就需要等到来年才能继续。这些科研上的困难也会使学生产生焦虑、抑郁等心理问题。

此外,还有研究发现,学生身体素质下降会影响心理健康^[23]。农林专业研究生科研任务重、实验时间长,长期处于不分昼夜的单调且快节奏的学习生活模式中。这会打乱人体正常的生物钟,而生理上的疲惫又会造成精神的过度紧张。

(三)就业压力

1. 就业困难导致消极心态

近年来,农林专业研究生人数虽然不断增加,但在就业率、就业质量等方面,与其他学科专业研究生相比面临着更为严峻的挑战。浙江农林大学对2011~2015届硕士研究生就业情况的调查结果显示:农林学科硕士毕业生的就业时间明显延迟,就业率显著低于非农林学科就业率及全校平均就业率^[24]。东北林业大学对2014届硕士研究生就业率的调查结果显示:在全校的学科中,农林学科研究生就业率仅排倒数第3位^[25]。甘肃农业大学对2011~2017年研究生就业质量的分析结果显示:农林学科就业率并不高,总体的就业数量和质量均偏低^[26]。此外,女研究生的就业相对困难。北京林业大学针对农林学科女研究生的一项调查显示,56%的女研究生认为未来就业面临困难^[27]。

导致农林专业研究生就业困难的原因是多方面的:一是当前农林专业研究生群体的就业形势愈发严峻,专业对口的公司等就业单位呈现利润低、发展

慢、人员需求少的特点^[28],农林专业研究生在就业市场的供求现状呈现消极态势^[29]。二是农林业生产周期长,课题研究和实践教学只能在特定时间段进行,所以农林专业研究生的科研论文和毕业论文需要投入很长的时间和较多的精力,这会除科研能力外的沟通、管理等其他能力的发展,从而使研究生难以达到就业单位的能力要求^[30]。三是农林专业研究生择业方向比较单一,大多数学生又有较高的就业期望,就业单位的选择存在“重东部、轻西部,重城市、轻地方”的观念。四是社会对女性就业存在性别歧视,认为女研究生毕业时已经到了适婚年龄,会很快选择结婚生子,这在一定程度上会对工作产生影响,所以许多单位更倾向于招聘男性^[28]。此外,当前我国农林业科技服务体系尚未完全成型,传统的“轻农林”“嫌农林”观念尚未完全根除,农林行业的社会认同低等,也是导致农林专业研究生职业选择面窄、就业困难的主要原因。

综上所述,就业难、就业质量差、社会认同度低等现实问题会导致农林专业研究生出现焦虑、自卑、迷茫、烦躁等消极心态,从而影响其日常生活和未来发展。

2. 专业认同不高、职业规划意识缺失引发心理困扰

农林专业研究生自身存在的专业认同度不高、职业规划意识不强等问题,也是影响其心理健康的重要因素。专业认同是指“学习者在认知和了解所学习学科的基础上,产生的情感上的接受和认可”^[31]。有研究表明,专业认同对大学生的成就动机、学习满意度^[32]、学习投入^[33]等具有正向预测作用,并且可以显著负向预测大学生的抑郁水平^[34]。陈慧等对湖南3所院校农林专业研究生进行专业认同调查的结果显示,大部分农林专业研究生对本专业的认同度较低^[19]。因此,农林专业研究生较低的专业认同度水平很可能会引发抑郁等负性情绪,使其在面对科研压力时更难以进行自我调节、对未来发展 and 职业选择难以决断,进而影响其心理健康水平^[35]。

职业生涯规划的主要作用是帮助学生明确职业目标,对未来进行详细的规划,从而实现职业理想。通过职业生涯规划,学生可以发现自己的理想与现实之间存在的差距,进而明确需要努力的方向,以缩小理想与现实之间的差距;同时,还可以及时预见就业过程中可能出现的问题和困难,加强心理建设,提前做好应对准备。由此可见,职业生涯规划与心理

健康教育是存在相关性的,二者逐渐形成了相互依存、相互促进的关系,所以做好职业生涯规划可以很大程度上避免就业过程中产生的心理困扰^[36]。然而,在职业生涯规划方面,一项针对四川农业大学、东北农业大学等5所高等农林院校的农学院和植物保护学院等农科类学生的调查表明,仅有32.4%的农科类学生“了解本专业毕业之后从事哪方面工作”^[38]。华中农业大学对农科专业研究生的调查表明,大多数农科研究生的职业规划意识不强,到毕业时都还没有比较清晰的职业规划^[38]。这可能是由于很多农林专业研究生的学习内驱力不足、对专业的就业前景认知不清晰。而职业规划的缺失又会进一步引发心理健康问题。

(四)人际交往压力

高校当前招收的很多研究生都是跨地区生源,所以研究生新生不仅面临全新的学习生活环境,需要与新老师、新同学打交道;而且需要适应所在学校、学院的人文环境。这都对研究生的适应能力和人际交往能力提出了较高要求。同时,部分农林专业研究生受家庭经济条件的限制,不仅难以承受维持社交所需费用带来的经济压力,而且由此也造成了其人际交往技能的缺乏。此外,研究生之间特别是同一年级或者同一宿舍的研究生之间存在的无形竞争,也会导致一定的人际交往障碍和情感压力^[39]。这些都会使学生形成孤独、敏感、自卑的心理。

1. 师生关系不良引发负面情绪

研究生与导师的关系是影响学生心理健康水平的重要因素。近年来,研究生导师与研究生之间由利益、价值观、认知层面的差异引起的矛盾冲突事件屡见不鲜^[40]。研究生因导师原因出现的极端事件频发,如2021年湖南某大学硕士研究生因毕业压力太大坠楼等。导师与研究生间的矛盾突出,不良的师生关系对研究生的心理健康造成了巨大的负面影响。一项覆盖1274名研究生的调查显示,导师的指导行为会直接影响研究生的心理健康^[41]。许多研究生存在害怕导师负面评价的现象,这种担忧和恐惧会进一步影响研究生的抑郁水平。研究生与导师的关系疏远,会显著负向影响研究生的主观幸福感、生活满意度等积极心态,同时显著正向影响抑郁、焦虑等负性情绪^[42]。此外,有研究显示,研究生对导师的排斥感知水平越高,生活满意度就越低,抑郁和攻击性水平则越高^[43]。

有研究者调查发现:导师指导风格在学科类型

上有显著差异,文科研究生导师的指导风格多为支持型,更注重与研究生的知识交流、互动和联结;理工科研究生导师的指导风格则多为控制型,更加严厉并强调研究规范和学科逻辑^[44]。由于农林专业研究生经常需要进行实验室实验和野外实验,科研任务相对较重;而导师忙于研究,与学生交流较少;再加上导师更多秉持了理工科导师的控制型指导风格,所以农林专业研究生与导师的互动氛围相对紧张,容易出现焦虑、抑郁的情绪。

此外,一项针对北京林业大学导师的调查结果显示,有46.7%的研究生导师表示在自己指导的研究生中存在有严重心理问题的学生^[45]。与此同时,由于理工科出身的农林专业研究生导师缺乏相关的心理学知识理论,也不具备足够的危机干预经验,所以通常无法及时帮助学生解决心理困扰、缓解消极情绪。

2. 同学间人际关系不和谐导致心理问题

农林专业研究生的课程分散,各自的作息和生活节奏都不一致^[46];同时,专业的特殊性需要农林专业研究生长期在野外或实验室开展科研工作,所以与其他学科专业研究生相比,与他人的接触和交往更少,人际交往范围更狭窄,更是缺少了一个可以倾诉、宣泄情感的渠道。这很容易导致同学间的人际交往不良。此外,部分农林专业研究生或因不善言辞,难以通过与同学直接沟通解决双方产生的问题和矛盾,所以往往最终以争执或争吵结束话题;或因性格内向,把问题深埋在心里,难以及时打开心结。久而久之,这种人际关系的不和谐会导致农林专业研究生性格孤僻乃至产生心理问题。

(五)研究生自身不良特质

1. 不良的人格特质

除外在因素的影响外,研究生自身的特质也会影响其心理健康水平。许多研究均表明,心理问题的发生与个体的人格特征、应对方式、思维模式等都有密切的联系^[47]。李梅、钟向阳针对农科研究生心理健康水平与人格特征关系进行研究的结果显示:心理问题与人格特征相关显著,良好的人格特征(较高的稳定性、兴奋性、有恒性、自律性等)将有利于心理健康,不良的人格特征(较高的敏感性、怀疑性、忧虑性、紧张性等)会对心理健康产生负面影响,而心理健康水平又影响人格的发展,从而形成循环^[48]。

一项关于抑郁症状与人格特征及应对方式的关系研究表明:抑郁症状与神经质人格特征、消极应对方式等相关显著,而且消极应对方式在神经质与

抑郁症状之间发挥一定的中介效应^[49]。这表明抑郁心理很可能是学生自身的人格特征以及消极的应对方式等共同作用导致的。因此,除了注重应对外在因素对农林类研究生心理健康的负面影响之外,也要注重培养学生自身积极的心理品质,进而提高其心理健康水平。

2. 偏离科研工作要求的学习动机

有调查表明:大多数农学类硕士研究生读研是为了通过获得学历达到自我提升的目的,而不是指向学习知识本身^[50]。例如:部分学生读研不是为了继续从事本专业工作,而是为了以后考公务员更加便利,所以并不重视专业知识的学习,只求顺利毕业拿到学位。因此,这样的学生在面临科研压力时更容易产生学业倦怠,难以主动学习,无法达到实现导师科研目标的要求,也更容易产生与导师间关系紧张的问题。

还有调查发现:不少学生选择农林专业是出于“保研容易”“更容易考”等原因,属于“成绩—回避”目标取向类型,即为避免消极的活动成果而选择相对简单的任务。然而,研究生通常都需要承担大量的科研任务,特别是农林类研究生受专业特性的影响更容易遇到科研失败的情况。这对“成绩—回避”目标取向类型的学生来说,在面临挫折时更难做到自我调节、迎难而上,而是会选择逃避。功利取向、回避困难等学习动机与科研工作所要求的纯粹性和探索性相矛盾,持有偏离科研工作要求学习动机的研究生通常对专业了解不足、学习欲望不高,所以更容易在压力较大的研究生学习生活中出现适应困难,产生放弃心理,从而进一步导致师生关系不佳、职业规划不明确等,进而使心理健康更难以得到保障。

3. 有偏差的个人情感素质

情感素质是个体相对稳定的、基本的与其发展阶段相应的积极的情感心理特征,涉及道德情感、人际情感和情绪智力等六大类及其下属的诸如爱国感、责任感、关爱感等几十种具体情感^[51]。积极的情感与合理的情绪调节有助于个体更好地适应社会和环境的需要,更有利于身心健康^[52]。因此,情感素质对研究生而言非常重要,不仅对个体的智慧和创造性产生影响,而且与个体的人格和价值观也有密切联系。

有调查研究表明,我国研究生的情感素质总体发展水平不高^[53]。一方面,现代生活的快节奏和高强度压力使学生的社会性情感在社会的扩展中负荷过重。一些研究生在情感发展上陷入懦弱、混乱、虚

浮、冷漠等危机中,概而言之就是“对人不感激、对物不珍惜、对事不负责”^[54]。有研究表明:34%的研究生承认多次抄袭别人的或摘取网络上的文章,近八成学生面对高价出资愿意替人做“枪手”^[55]。另一方面,随着研究生招生规模的扩大,学业压力和就业压力越来越突出。但是,与此同时,研究生的情感素质发展却被学校和个人所忽视,从而导致研究生出现一些极端行为,甚至发生自伤、自杀事件^[56]。如大连理工大学研究生自杀、中南大学硕士生坠亡和研究生虐猫等极端恶性事件,其本质都是情感素质问题^[57]。

此外,一项针对全国研究生情感素质现状的调查表明,文科研究生的情感素质发展比理工科研究生更好^[53]。这可能是因为部分理工科(包括农林科)院校及导师在研究生培养过程中存在“重科研成果(专业技能)、轻情感教育”的问题,从而导致研究生难以获得良好的培养情感素质的环境。由此可见,情感教育的缺失会对农林专业研究生的心理健康产生极大的负面影响。

二、提高农林专业研究生心理健康水平的对策

(一)全面宣传国家的奖助政策,加大农林专业研究生的奖助力度

当前,我国的研究生奖助体系虽已相当完善,但由于信息不对称,部分研究生对相关政策的知之甚少。因此,为了使更多的农林专业研究生得到学校和社会的帮助与支持,减轻他们的经济压力,高校要积极宣传研究生奖助政策,指导农林专业研究生全面了解和正确理解相关政策^[58]。只有让全体学生了解国家奖助政策的基本内容和作用,才可以更好地发挥研究生奖助政策的效用。

不同学科专业研究生的培养目标和培养模式存在差异,所以培养成本和收益也有所不同^[59]。农林学科专业是公共收益大于私人收益的专业,农林专业研究生的培养具有课题任务重、实验环境相对较差、科研条件艰苦等特点。因此,对不同学科专业的研究生,高校在奖助形式和奖助力度等方面要有所侧重和区别,应加大对农林专业研究生的奖助力度,以缓解经济困难研究生的经济压力 and 人际交往压力,激励农林专业研究生主动学习、将精力更多地投入到科研创新中。

(二)结合思想政治教育,引领农林专业研究生积极心理品质的培养

农林专业研究生经常需要去野外完成科研任务

或长期驻守实验室开展研究,这对其心理品质提出了较高要求。针对当前部分农林专业研究生存在的意志不坚定、吃不了苦的消极心态,高校要加强课程思政建设,除了充分发挥思政课程的作用之外,还要注重将思政教育元素融入专业课程教学,实现协同育人,引导学生树立正确的价值观,培养吃苦耐劳、勇毅力行的传统美德,以红色文化的道德引领实现积极向上的思想引导,从而为积极心理品质的培养奠定扎实的基础。例如:配合专业课程的教学目标要求,通过介绍中国古代农林业发展历史,引导学生认真思考和养成中国优秀传统美德以及顽强拼搏的精神品质;围绕教学主题引导学生进行个性化阅读,以优秀传统文化升华道德思想境界;通过在课程教学中介绍在专业领域做出突出贡献的专家事迹,以“润物无声”的形式将正确的价值追求和理想信念有效传达给学生。

(三)完善就业政策,开展专业认同教育和职业生涯规划教育

针对当前农林专业研究生因就业困难而产生心理问题的情况,在宏观层面,国家和各级地方政府一方面可以面向涉农林业专业研究生制定一些有针对性的就业扶持政策,如对到农村基层就业的学生予以相对较高的薪酬待遇,或者建立到基层工作若干年后可以二次选择较好工作岗位的就业激励机制等;另一方面,可以通过提供免息贷款或资金资助等,鼓励农林专业研究生自主创业,从而缓解因就业压力产生的焦虑、紧张心理^[60]。

在微观层面,首先,高校应加强农林专业研究生的专业认同教育。一是要注重入学前的专业科普教育^[50]。当前社会上依旧存在对农林专业的消极刻板印象,所以教育部以及各高等农林院校应面向广大学生和家長做好农林业的宣传工作,展现农林业良好的发展前景,还原真实的农林专业面貌。二是要通过课程改革提高学生的专业认同水平。例如:设置“专业概论”等对农林业进行总体、系统介绍的课程,帮助学生全面认识专业。再如:设置与当前世界农林业研究领域接轨的专业课程,引导学生了解学科前沿研究方向,提高学生的专业自豪感。三是要多组织学术论坛、沙龙、讲座等专业性强的交流活动,促使学生更加了解专业领域的动态;同时,要提供更多与专家学者交流的宝贵机会,激励学生把更多精力投入到专业学习中,从而达到专业认同教育的目的。其次,高校应通过举办职业生涯规划讲座、开设职业生涯规划课程等,帮助农林专业研究生提前思考并明晰自己未来的

发展方向;同时,应注重培养一支专业的职业生涯规划服务团队,为学生提供一对一的咨询和辅导,进一步提高职业规划的科学性。此外,作为研究生培养的第一责任人,导师也应参与到学生的职业生涯规划过程中,凭借自己积累的职业生涯经验以及对专业领域和学生较为深入和全面的了解,帮助学生找到适合自己的职业道路^[61]。

(四)完善心理健康教育服务体系

1. 面向全体研究生构建心理健康服务网状格局

目前,大多数高校针对本科生的心理健康教育服务已经比较完善。但是,由于研究生人数相对较少,而且通常由导师负责管理,所以许多高校对研究生的心理健康教育缺乏重视。当前,研究生的心理健康教育服务体系大多是以心理咨询为主体、建档普测和其他心理健康教育活动为辅。这种扁平化的格局通常只能为少数存在严重心理问题的研究生服务,难以给予全体学生更加有深度、有效果的心理健康教育服务。因此,高校首先要升级学校心理健康教育服务体系,改变扁平化格局,以服务全体研究生的心理健康为宗旨,构建心理咨询、建档普测、危机干预、其他心理健康教育活动等共同发挥作用的以课程教育教学为中心的网状格局^[4];其次要以课程教育教学为主阵地,广泛普及建档普测、危机干预、讲座、沙龙等各种心理健康教育服务活动的主要内容及意义,改变学生对心理健康、心理咨询的刻板印象,使学生提高对心理健康的重视程度并了解学校的心理援助渠道,从而切实满足全体研究生日益增长的心理健康发展需求。

2. 开设心理健康教育课程,建立网络心理健康教育平台

最近针对北京农学院全日制硕士研究生进行的一项调查的结果显示,选择“到心理咨询室求助”作为压力调节方式的研究生不足1%^[62]。由此可见,农林专业研究生存在对心理健康不够重视的情况。因此,高校应针对农林专业研究生在科研、人际、就业等方面面临的现实压力,开设以心理调适、人际沟通、职业生涯规划等为主题的心理健康教育课程,以引导农林专业研究生正确认识心理健康的重要性并加强对心理学相关理论的了解和学习,切实解决其现实困难,满足其心理发展需求。

同时,鉴于农林专业研究生科研任务繁忙,高校应拓展心理健康教育服务体系,建立网络心理健康教育平台,提供网络讲座、精品课程、网络心理咨询等,使学生能够从更多渠道获得心理支持。

目前一些高校在网络心理健康教育平台建设方面进行了积极尝试,如北京师范大学的“京师心晴网”、北京航空航天大学“i-home”平台^[63]、北京林业大学的“北林心委会”公众号等。这些网络平台承载了生涯辅导、健康教育、生活辅导和科研交流等多种功能,设置了以文章、资讯、影音等多种形式展示内容的心理教育栏目,并以互动的方式提供了优质的心理咨询和职业生涯规划服务。网络平台的虚拟性拓展了心理健康教育服务的时空范围,其隐私性使学生可以以更加开放的心态进行自助和求助,从而与实体的心理健康教育服务形成优势互补^[64]。高等农林院校也可以学习借鉴这些高校的先进经验,建立相应的网络平台,借助微博、微信公众号等为农林专业研究生提供更加全面的心理健康教育服务。

3. 建设自上而下的心理健康教育系统

针对高等农林院校在研究生心理健康管理方面缺乏专业人员的情况,建议学校建立自上而下的心理健康教育系统,完善“心理健康教育中心—辅导员/二级辅导工作站—心理委员/宿舍长”三级管理。其中,一级管理由学校成立的专门工作组领导下的心理健康教育中心负责,二级管理由各学院党总支领导下的辅导员与由心理学专业教师或研究生组成的二级辅导工作站共同负责,三级管理由各学院学生班级的心理委员与宿舍长共同负责,从而通过三级联动、三管齐下共同促进高等农林院校研究生心理健康水平不断提高。

校级心理健康教育中心的职责是:指导各学院辅导员以及二级辅导站的工作,组织对辅导员和二级辅导站成员的培训工作,开展学校日常的心理健康教育活动。各学院辅导员及二级辅导工作站的职责是:关注学生动态,建立有心理问题学生的追踪档案;二级辅导工作站协助辅导员对班级心理委员和宿舍长等基层心理健康教育管理人员进行有针对性的专业培训,如识别问题心理以及进行简单团体辅导等技能的培训。学生心理委员及宿舍长的职责是:经过培训后可以协助组织开展班级心理健康教育活动,及时关注班级和宿舍中需要心理援助的同学,促进班级、宿舍的心理健康生态良好发展。

以北京林业大学为例,自2020年开始在各二级学院陆续设立的二级辅导站,开展了大量的心理健康教育工作并取得了初步成效。例如:协助学院对重点学生进行心理状态评估,制作心理月报、开展

“信箱活动”,组织班级学生心理委员的培训,开展个体心理咨询和团体心理辅导活动等。

4. 提升研究生导师的综合素质,着力改善师生关系

当前大多数农林专业研究生导师缺乏对研究生培养的深度思考,在研究生培养过程中存在“重成果、轻培养”的问题,从而导致学生在科研压力下心理健康水平下降。因此,建议高等农林院校采取以下措施。

第一,要针对农林专业研究生导师的指导风格多以控制型为主的问题,通过提升导师综合素质和人格魅力推动导师转变研究生培养观念,形成将人文教育作为研究生培养首要任务的指导理念,同时转变“师道尊严”的传统思想,在指导学生的过程中以人文关怀的态度对待学生,学会宽严并济,采取平等尊重、民主多元的模式与学生相处,构建更有利于学生成长的师生关系。

第二,在研究生导师的考核评价方面,应降低对“科研成果”的关注,增加“研究生评价”的权重。例如:建立学生匿名评价导师的机制,明确规定研究生每学年都要对导师的师德和师风以及对学生的关心程度等进行匿名评价,并及时将评价结果反馈给导师,以引起导师对改善师生关系、提高研究生心理健康水平等的高度重视。

第三,当前很多农林专业研究生导师在指导研究生过程中存在师生沟通频率低、对学生心理健康缺少关注、对心理健康教育缺乏责任感等问题。而导致问题产生的深层次原因是很多导师身兼数职或所带学生过多。因此,一方面,应引导研究生导师在保证学生培养质量的前提下适当接受社会和行政任职;另一方面,对肩负多重职责的研究生导师,要将其研究生指导数量控制在合理范围,从而确保导师有足够的精力对学生进行深入学术指导和心理健康教育。

第四,应加强对农林专业研究生导师的定期培训,通过专业理论和技能培训,使导师掌握一定的心理健康教育理论和心理问题识别技巧,以及培养与学生深度沟通的能力^[65]。同时,应将导师纳入研究生心理健康支持系统。因为导师作为研究生的重要他人,与学生直接接触最多,可以及时了解学生在生活、学习、喜好方面的情况特别是近期的烦恼等,也更容易了解学生的内心世界,从而以亦师亦友的良好师生关系为桥梁更有效地实施心理健康教育^[66]。

5. 建立家校联系制度

针对研究生的心理健康问题,除了学校要采取应对措施努力解决之外,学生家庭的作用同样不可忽视。有许多相关研究表明,研究生的心理健康和人格发展受到家庭教育的重要影响^[67],家长的教养方式、亲子沟通的质量等都在一定程度上影响着学生。因此,高校要重视发挥家庭教育的作用。农林专业研究生大多来自乡镇农村家庭,较为普遍地存在父母文化水平不高、亲子沟通不多等情况。所以高等农林院校应通过建立家校联系制度,密切家庭与研究生子女的联系,全方位对研究生进行心理健康教育^[68]。一方面,学校的心理健康教育中心和各学院的二级辅导工作站可以通过对家长进行有关家庭教育、亲子沟通的系统培训和指导,使其能够以家长的视角了解研究生子女的心理健康情况,并努力营造良好的家庭氛围。另一方面,学生辅导员和导师等可以通过开家长座谈会的方式,了解研究生的家庭成长环境,定期向家长反馈学生的在校状况,以便及时发现和解决问题。

(五) 重视情感教育,提升学生情感素质水平

相关研究显示,仅有三分之一的研究生情感素质处于优秀水平^[53]。这表明包括农林专业研究生在内的各学科研究生在情感素质方面仍有提升的空间。同时,许多研究都表明:情感素质对个体的心理健康具有重要影响^[69],较低水平的情感素质会导致学生学习动机较弱、人际关系不良,甚至出现严重的情绪行为问题^[70]。因此,高等农林院校需重视对农林专业研究生的情感教育。首先,要做到尊重并满足学生的情感需要。例如:研究生导师以及任课教师可充分利用科研和教学环节以及课余时间与学生进行真诚且富有情感的交流,以情育情。其次,要培养学生高层次的情感素质,如道德情感、审美情感等,使学生真正做到把个人情感与正确的人生观、价值观、世界观相联系,将“小我”融入“大我”。例如:任课教师可通过挖掘课程教材中蕴含的情感元素,使学生在课堂教学中学习到做人做事的优秀品质^[71]。最后,要加强学生积极情感的培养,避免学生因情绪问题引发心理困扰。例如:可结合与心理健康教育相关的课程内容开展多种交流活动,如书信交流活动、家长座谈会、师生座谈会等,以加深学生间、学生与家长间、学生与教师间的情感交流,从而形成良好的校园文化氛围,进而促进积极情感的发展^[54]。

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地方农林院校文科研究生培养改革的路径研究

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摘要: 农林院校在地方经济社会发展中发挥了显著作用,为地方的农业、林业等领域培养了大量优秀人才,推动了地方经济的繁荣和社会进步。人文社科在农林学科发展中扮演着至关重要的角色,对农林院校的持续和均衡发展具有不可忽视的作用。然而,目前以文科研究生为代表的农业高层次管理人才缺乏问题仍比较突出,文科研究生培养定位“不接地气”、培养方向与社会发展实际需求相脱节、培养资源有限、培养软环境建设滞后等问题,严重影响了文科研究生的人才培养质量。为解决这些问题,需要统筹协调社会资源,合理配置资源,加强地方院校与政府、农林企业、科研单位、重点院校的紧密合作;需要强化顶层设计,确保地方农林院校的培养目标与地方政府发展规划相协调;建立多种合作模式、加强教育体系建设、完善研究生培养规划、精心构建研究生课程体系、突出地方经济特色,以期提高文科研究生科研素养,培养适应地方经济社会发展需要的懂技术、会管理的高层次人才。

关键词: 地方农林院校;文科研究生;资源整合;人才培养;研究生教育

一、地方农林院校研究生培养面临的机遇和挑战

党的十九大提出的乡村振兴战略是我国新时代农村工作的总抓手和总方向,旨在解决人民日益增长的美好生活需要与农村不平衡不充分发展之间的矛盾,有效推进乡村全面振兴,为解决“三农”问题指明了重要方向。农业作为立国之本,在乡村振兴战略实施和城镇化快速推进的背景下,始终保持着至关重要的地位。农业直接关系到国家粮食安全、农民福祉,甚至关系到国家的长治久安。随着农业现代化的逐步推进,农业和农村发展对人才提出了更高、更多样化的要求。2020年7月,习近平总书记对研究生教育工作作出重要指示:“党和国家事业发展迫切需要培养造就大批德才兼备的高层次人才。研究生教育在培养创新人才、提高创新能力、服务经济社会发展、推进国家治理体系和治理能力现代化方面具有重要作用。”^[1]

地方农林院校在地方经济社会发展中发挥了卓有成效的人才支撑作用,为地方的农业、林业等领域培养了大量优秀人才,推动了地方经济的繁荣和社会进步。然而,目前我国农林院校培养的人才还远

远不能满足地方农林经济社会发展的需求,人才资源配置不合理、学历与社会需求倒挂、导师与研究生比例失衡、培养目标与社会经济发展脱节、人才培养滞后于社会发展、学术不端持续加重、研究生功利主义思潮泛滥,尤其是以文科研究生为代表的农业高层次管理人才缺乏问题依然比较突出。这些问题严重影响了研究生人才培养质量,造成人才培养结构性失衡,对落实乡村振兴战略和实现农业农村现代化产生了不利影响。

二、地方农林院校文科研究生培养面临的问题及原因分析

在当前形势下,地方农林院校为了增强自身的竞争力和影响力,扩大办学规模以及合并、重组、转型为综合性大学已成为不可忽视的趋势。随着研究生教育规模的不断扩大,文科研究生培养过程中面临一系列挑战。其中,研究生培养与社会发展实际脱节、导师指导水平参差不齐、学术交流和互动不足等问题日益突显。大部分研究生过于注重为毕业而毕业,缺乏对科研精神和研究品质的认知与追求。另外,地方农林院校与科研院所、地方政府、农林企业各自为阵,缺少有效沟通和交流,导致教育资源的

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情绪和社会阶层之间两两呈显著相关。

表1 描述统计与相关关系矩阵($n=1808$)

变量	$M\pm SD$	1	2	3	4
1.社会责任感	99.14±13.57	1			
2.亲社会行为	81.03±15.67	0.41**	1		
3.积极情绪	28.18±7.81	0.28**	0.47**	1	
4.社会阶层	2.89±0.99	-0.17**	0.06*	0.19**	1

注: * $P<0.05$, ** $P<0.01$ 。

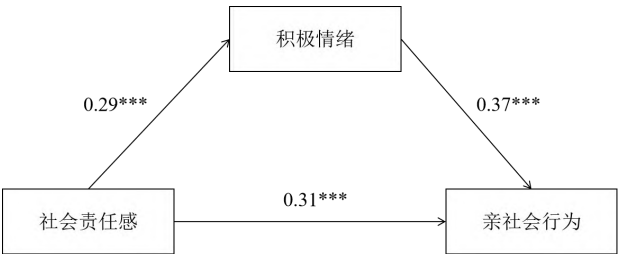
2.3 中介与调节效应分析

2.3.1 中介效应检验 根据本研究提出的假设模型,以社会责任感为自变量,亲社会行为为因变量,积极情绪为中介变量,同时控制性别与年龄建立结构方程模型,对所有变量进行标准化后采用PROCESS中的Model 4进行中介模型检验(见表2)。由表2可知,社会责任感显著正向预测亲社会行为($\beta=0.31$, $P<0.001$),社会责任感显著预测积极情绪($\beta=0.29$, $P<0.001$),积极情绪显著正向预测亲社会行为($\beta=0.37$, $P<0.001$)。中介效应模型图如图2所示。

表2 中介效应检验结果

变量	中介变量:积极情绪			因变量:亲社会行为		
	β	SE	t	β	SE	t
社会责任感	0.29	0.02	12.84***	0.31	0.02	14.86***
积极情绪				0.37	0.02	18.16***
性别	-0.16	0.05	-3.40***	-0.10	0.04	-2.36*
年龄	0.02	0.00	5.20***	0.02	0.00	4.23***
R^2	0.10			0.31		
F	65.98***			205.59***		

注: * $P<0.05$, *** $P<0.001$ 。



注: *** $P<0.001$ 。

图2 积极情绪的中介模型图

中介效应显著性Bootstrap分析显示,社会责任感对亲社会行为的总效应值为0.42,直接效应值为0.31,Bootstrap 95%CI为[0.27, 0.35]。表明模型中纳入积极情绪这一中介变量后,社会责任感对亲社会行为仍具有显著的直接效应,直接效应值占总效应值的73.81%。积极情绪在社会责任感和亲社会行为之间的中介效应显著,中介效应值为0.11,Bootstrap 95%CI为[0.09, 0.13],占总效应的26.19%。

2.3.2 调节效应检验 根据本研究提出的假设模

型,以社会责任感为自变量,亲社会行为为因变量,积极情绪为中介变量,社会阶层为调节变量,同时控制性别与年龄建立结构方程模型,采用PROCESS中的Model 15检验社会阶层的调节作用(见表3)。

表3 中介调节效应检验结果

变量	中介变量:积极情绪			因变量:亲社会行为		
	β	SE	t	β	SE	t
社会责任感	0.29	0.02	12.84***	0.15	0.06	2.36*
积极情绪				0.15	0.06	2.56*
社会阶层				0.06	0.02	2.62**
社会责任感×社会阶层				0.06	0.02	2.77**
积极情绪×社会阶层				0.07	0.02	3.61***
性别	-0.16	0.05	-3.40***	-0.09	0.04	-2.18*
年龄	0.02	0.00	5.20***	0.02	0.00	4.30***
R^2	0.10			0.33		
F	65.98***			124.13***		

注: * $P<0.05$, ** $P<0.01$, *** $P<0.001$ 。

中介与调节效应显著性Bootstrap分析显示,社会责任感和社会阶层的交互项对亲社会行为的预测作用显著($\beta=0.06$, $P<0.01$),积极情绪和社会阶层的交互项对亲社会行为的预测作用显著($\beta=0.07$, $P<0.001$),说明社会阶层在社会责任感对亲社会行为影响的直接路径以及积极情绪对亲社会行为影响的路径上起调节作用。

将社会阶层按 $M\pm 1SD$ 分组,对社会阶层的调节作用进行简单斜率检验,进一步揭示社会阶层与社会责任感、社会阶层与积极情绪对青年亲社会行为的交互效应。结果显示,当社会阶层较低时,社会责任感对青年亲社会行为的正向预测作用显著($\beta=0.26$, $SE=0.03$, $P<0.001$);当社会阶层较高时,社会责任感对青年亲社会行为的正向预测作用增强($\beta=0.38$, $SE=0.03$, $P<0.001$)。类似地,当社会阶层较低时,积极情绪对青年亲社会行为的正向预测作用显著($\beta=0.28$, $SE=0.03$, $P<0.001$);当社会阶层较高时,积极情绪对青年亲社会行为的预测作用增强($\beta=0.42$, $SE=0.03$, $P<0.001$)。无论社会阶层低还是高,社会责任感和积极情绪对亲社会行为的预测作用均显著,但随着社会阶层上升,亲社会行为随社会责任感、积极情绪的提高而发生的变化更为明显,即社会阶层的提高增强了社会责任感和积极情绪对亲社会行为的促进作用。

3 讨论

本研究聚焦社会中最积极、最有活力的青年群体,探究了社会责任感对其亲社会行为的直接效应,并进一步揭示了社会责任感对亲社会行为的作

用机制,对社会责任感如何促进亲社会行为这一问题给出了更清晰的解释。研究结果为亲社会行为的认知-脑回路神经模型提供了实证支持,同时有助于促进未来青年亲社会行为的相关实践。

本研究发现,社会责任感正向预测青年的亲社会行为,与以往针对儿童的研究结果类似^[33,34]。该结果提示,社会责任感越高的个体越能够基于道德义务和价值观调整自己的行为以符合社会期望,从而做出更多亲社会行为^[35]。因此,提升青年社会责任感,促进青年形成内化的个人规范,是激发青年做出亲社会行为的有效途径。

本研究中,社会责任感通过积极情绪间接促进青年的亲社会行为,该结果支持了亲社会行为的认知-脑神经回路模型中奖励系统-亲社会行为的路径。先前研究发现社会责任感可以激发积极情绪^[36]。情绪是个体指导后续行为的重要线索,积极情绪的唤起能够激发个体采取更多行动以获得类似的积极体验^[18],指引个体关注他人需求,从而做出更多亲社会行为^[37]。本研究结果表明,社会责任感的提高能够促进个体积极情绪的提升,而积极情绪能进一步促进亲社会行为。

本研究发现,社会阶层能够调节社会责任感对青年亲社会行为的直接影响路径。相较于低社会阶层,高社会阶层个体在社会责任感增强后所做出的亲社会行为有更大幅度的提升。同时,本研究中,社会阶层也调节了积极情绪对亲社会行为的影响路径。提示虽然积极情绪水平的提高对不同社会阶层的亲社会行为均有促进作用,但这种促进作用同样在高社会阶层中更大。不同社会阶层的个体拥有的资源不同,根据资源保存理论,资源充足的个体更愿意进行资源投资,而资源相对匮乏的个体则更倾向于保护资源,避免资源的损失^[38]。亲社会行为具有资源消耗的性质^[39],个体可能需要付出时间、金钱、社会关系等。由于对社会资源的占有不同,低社会阶层个体实施亲社会行为需要付出更高的代价^[40],因此在做出亲社会行为决策之前,低社会阶层个体将花费更多时间和精力衡量付出与回报。相反,高社会阶层个体对失去资源的顾虑较少,因而更有能力做出亲社会行为。因此,在社会责任感和积极情绪的促进之下,高社会阶层个体的亲社会行为倾向更强。同时,作为亲社会行为的实施者,高社会阶层个体在社会责任感与积极情绪增强后表现出的亲社会行为倾向有更为明显的提升,这一过程可能对于社会发展的推动作用也将更为突出。因此未来应考

虑以差异化手段,针对不同社会阶层的青年培育社会责任感,尤其注重激发高社会阶层青年的社会责任感和积极情绪,引导其实施更多亲社会行为。

本研究只关注了积极情绪在社会责任感与亲社会行为之间的中介作用,近年有研究提出痛苦的利他主义模式,表明消极情绪(如痛苦)或生活事件(如暴力经历)对亲社会行为同样具有促进作用^[41,42]。因此,未来研究可继续探讨其他情绪类型与亲社会行为之间的关系。

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园艺团体辅导对小学生焦虑与注意力的影响

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摘要:采取量化、质性分析手段研究了园艺疗法对小学生焦虑的影响及其内在作用机制。研究一通过问卷法调查分析小学生的注意力和焦虑状况;研究二引入园艺团体辅导,探究小学生的焦虑是否降低以及注意力是否为内在作用机制;研究三为质性研究,对园艺团辅过程中积累的大量质性资料进行分析。结果表明:①小学生确实存在焦虑状况且注意水平能够显著负向预测焦虑;②在园艺团辅作用下,实验组的焦虑水平显著降低;③在园艺团辅作用下,实验组的注意力水平显著提升;④在园艺团辅对焦虑的作用中,注意力的中介作用不显著;⑤在主观感觉上,园艺活动能够给人带来愉悦的心情,提高解决问题的能力,提升专注程度并且缓解焦虑。

关键词:园艺疗法;焦虑;注意力;中介作用

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The Effect of Horticultural Group Counseling on Pupils' Anxiety and Attention

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Abstract: Pupils have different degrees of anxiety and their attention level is relatively low due to restricted cognitive development. Horticultural therapy, as an ecological psychological treatment method, has a significant effect on anxiety and attention. There have been many experimental and clinical studies on horticultural therapy abroad, and a complete theoretical system has been established. However, few domestic scientists have relevant experiments and clinical reports. This study used both quantitative and qualitative analysis methods to explore the effect of horticultural therapy on pupils' anxiety and its internal mechanism. After analyzing the attention and anxiety of primary school students through the questionnaire survey, we designed horticultural group activities and explored its effect on improving primary school students' anxiety and attention. In addition, we also explored whether attention is the mediating variable. The results show that the primary school students do have anxiety and their attention level can significantly negatively predict anxiety. The anxiety level of the experimental group was significantly reduced and the attention level was significantly improved by participating horticultural activities. However, the mediating role of attention is not significant in the effect of the horticultural on anxiety. In qualitative analysis, we found that horticultural can also bring happy mood, relieve anxiety, improve problem-solving ability, improve attention and concentration, which is of great significance to mental health.

Key words: horticultural therapy; anxiety; attention; mediation

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一、理论基础

(一) 园艺疗法及其研究现状

自然对人的积极作用在许多领域中逐渐得到重视。在心理治疗领域,自然主要作为一种辅助疗法,起着治愈身心的作用^[1]。自然辅助疗法又可分为园艺疗法和自然环境疗法。关于园艺疗法,美国园艺疗法协会的定义得到了普遍认可,即利用植物栽培与园艺操作活动,对有必要在身体及精神方面进行改善的人们,从其社会、教育、心理及身体诸方面进行调整更新的一种有效方法^[2]。

自然对人的积极作用主要可以通过亲生命性假设、压力恢复理论、注意力恢复理论3个方面进行解释^[1]。亲生命性假设认为人类在长期进化过程中,在遗传上已经形成了偏好自然环境的机制,当人们处在自然环境中时,就会诱发积极的心理反应。因此,人类越是参与到自然中,他们越能与自己的进化本源建立联系,进而变得更健康、更安乐^[3]。压力恢复理论认为自然包含无威胁性的风景元素、绿色植物元素、特定的自然景观这3种能够激起人类积极情绪反应的元素。当人们处于上述3种元素中时,能够快速从应激中恢复体力,获得积极的情绪体验,从而较快从压力中恢复过来^[4-5]。注意力恢复理论认为,人有两种注意,有意注意与无意注意。有意注意一般指向特定的注意对象,需要努力和大量的精力才能保持,长时间的有意注意容易使人产生疲劳,导致注意力集中困难。无意注意指自动发生的、无须努力的、不需要投入大量精力的注意。人们在自然环境中使用的注意都以无意注意为主,这样能够缓解有意注意带来的疲劳,进而感到自己充满能量^[6]。亲生命性假设强调人类对自然的亲近性,压力恢复理论强调自然对应激的缓解作用,而注意力恢复理论则强调自然对注意力疲劳的恢复作用。在园艺活动中,作为自然刺激物存在的主要为花、草等小型植物,品种繁多,色彩丰富。心理学领域的色彩心理学认为,不同的色彩能够引起人们不同的联想,产生不同的心理效应,进而引发不同的情感。绿色能够给人以安全、宁静的感受^[7]。在与绿色植物的接触中,人们的身心都能得到治愈。除了色彩以外,芳香植物在生长过程中挥发、释放的香气具有一定的改善生理心理健康的作用,如薰衣草等植物^[8]。

我国目前对园艺疗法的研究还停留在介绍国外研究状况和普及园艺疗法相关知识层面上,实践中还没有关于园艺疗法的相关学术期刊和大型园艺疗法项目^[9]。综合国内外的研究进展来看,园艺治疗适用对象按人群特点大致可以分为两类,一类是精

神障碍患者,另一类是亚健康人群。园艺疗法已经显现出在精神疾病患者^[10]、行为障碍儿童^[11]、智障儿童^[12]、孤独症患者^[13]、痴呆患者^[14]、抑郁症患者^[15]等多种障碍患者治疗方面的显著效果,在临床应用治疗上得到广泛认可。对亚健康人群,园艺疗法活动同样适用,并能达到高参与度、自我激励以及趣味性的目标^[16]。研究表明,通过8~12次的园艺团体心理辅导活动(以下简称团辅活动),学龄前儿童的同伴互助和任务参与程度得到提高^[17],初中生的疏离感程度显著降低^[18],高中生的希望感得到提高^[19],老年人的幸福感得到提高^[20],大学生的心理健康水平能够提升^[21]等。无论是在理论上,还是在实证上,园艺疗法都表现出了广泛且良好的应用性。

(二) 园艺疗法与小学生的注意、焦虑问题

受注意力发展水平的影响和限制,小学生在学抽象符号时会利用具体环境、人际交往、动手操作来促进符号学习^[22]。有研究表明,绿色户外环境相比其他环境可以显著减少儿童的注意缺陷多动障碍症状^[23]。同时针对小学生也存在的不同程度的考试焦虑^[24]、社交焦虑^[25]等问题,团辅活动可以在一定程度上缓解焦虑情绪,提高心理健康水平^[26]。

在理论上,园艺疗法是能够通过具体环境、人际交往、动手操作这3条路径来改善小学生注意力水平的。同时,把团体心理辅导与园艺活动相结合,发挥绿色植物在降低焦虑方面的作用^[27],不失为一个能够显著降低焦虑的优秀治疗方法。

小学生作为园艺疗法的适用群体,已有大量研究实证证明,经过一段时间的园艺活动后,小学生们的自我概念、幸福感^[28]和注意力^[29]有了显著提高,压力问题得到改善^[30]。儿童时期与自然的互动越多,越能培养积极的价值观^[31];对女孩来说,还会导致其自律水平更高^[32];园艺活动与电子学习结合也有助于对小学生的生命教育^[33]。

(三) 园艺疗法对焦虑与注意力的作用

1. 园艺疗法对焦虑的作用

研究发现园艺疗法能启发人的五官六感,从视觉、听觉、味觉、嗅觉以及触感,感受植物的能量,降低血压,激活副交感神经系统,缓解压力,降低焦虑,产生愉悦的心情^[34-36]。园艺疗法对焦虑的作用可以通过压力恢复理论和园艺疗法的动力循环理论来解释^[34, 37],并且在生理层面能看到明显效果。研究发现行走在森林里、聆听自然环境的声音等活动能够显著降低唾液皮质醇、舒张压、脉搏率、皮肤电以及心率等生理指标,降低压力状态下的交感神经系统激活水平,使人们恢复活力^[37-38]。还有一些研究发现闻植物芳香能降低大脑的 α 和 β 波^[39],观看

植物风景照片能产生高波振幅,且被试主观报告焦虑值降低^[4]。除了生理方面的证据,在通过心理量表评估的研究中证明园艺疗法也有显著效果。研究者发现,在办公室里放置玫瑰及其他植物,就能缓解工作者的焦虑情绪,促进积极情绪^[27,40]。有不同研究针对心理疾病住院患者、高中女生、临终病人这些人群实施了特定的园艺疗法,结果显示园艺活动能够显著降低这些人群的焦虑值,且效果优于对照组^[41-43]。上述研究表明,涉及了多感官参与的多样园艺活动对降低焦虑是有效的。

2. 园艺疗法对注意力的作用

注意力恢复理论将注意力分为有意注意和无意注意,并认为无意注意能减少有意注意导致的专注力损耗,而自然环境能够减少无意注意,进而对有意注意损耗造成的疲劳起到恢复作用^[6]。因为人们对无威胁的自然环境的反应是即时的、无意识的,不需要占用认知资源,所以在面对自然元素、接触自然环境时,人们能较快地从压力状态恢复过来,而压力的降低有助于注意力恢复^[5,44]。研究发现,相比于美学设备,植物更能使人们缓解注意力,并有缓解疼痛的效果^[45]。多动症儿童在公园散步 20 min 后,注意力显著提高且注意集中程度优于在社区环境内散步,效果与药物相当^[29]。综合以上理论以及实证研究,说明在园艺活动中人们的注意力能够得到恢复,从而注意力水平得到提高。

注意资源理论^[46]认为,注意加工资源是有限的,需要注意控制,也就是将注意力集中在当前任务上^[47]。心理学领域中针对注意力进行测量的问卷大多聚焦在个体在完成任务时的注意力集中程度上。有研究表明,注意控制可以作为一种应对策略来避免消极的情绪^[48];注意力训练能够改善小学生的考试焦虑^[49]和高中生的焦虑水平^[50]。高焦虑个体总是将更多的注意资源放在自我关注上,而影响对当前工作任务的加工,会出现经典的注意偏向现象^[51]。对在学习中产生焦虑的个体进行研究,都出现了上述现象^[52-53]。由此可见,焦虑与注意、注意控制有密切联系。焦虑影响注意,损害注意控制,反之,注意控制又能够调节焦虑^[47]。在此基础上,焦虑与注意关系的研究进一步发展,发展出了认知干扰理论、加工效能理论和注意控制理论,从更深的层次解释了焦虑与注意相互影响的内在作用机制。

(四)模型的提出及解释

由上述内容可知,现在已有大量研究从生理和心理方面证实了园艺疗法对缓解焦虑的作用,注意力恢复理论^[6]说明了园艺疗法中的自然元素可以显著提高注意力水平,同时注意资源理论^[46]很好地解

释了注意控制与焦虑之间的双向关系。综合以上理论与实验研究,我们建立了“园艺疗法—注意—焦虑”模型,系统地解释园艺疗法、注意力与焦虑之间的两两关系:园艺疗法可以提高注意力和降低焦虑水平,注意控制可以降低焦虑,焦虑会影响注意。通过构建模型,我们发现了一条没有实证证明,但可以从理论上进行解释的通路,即“园艺疗法—注意力—焦虑”通路。三者理论上呈“园艺疗法能够提高注意力,进而降低焦虑水平”的关系,而“园艺疗法—焦虑—注意力”并不存在此传递性影响特征。基于此通路,本研究设计了有关园艺疗法的团体辅导方案,试图验证其对小学生焦虑的缓解作用,并探究其内在的作用机制及注意力在其中起到的作用。

二、研究一:小学生注意力和焦虑现状调查及特点分析

(一)研究目的

通过问卷收集有关小学生们的人口学信息、注意力和焦虑水平,探讨小学生们的成绩、性格、是否为独生子女、与绿色植物的接触情况、家庭状况、同伴关系等人口学因素是否会影响注意力与焦虑水平,同时检验注意力与焦虑水平之间的关系是否符合模型的预测。

(二)被试

研究一于 2019 年 4 月进行,选取了某小学六年级一班、二班的学生共 67 名,其中男性 34 名,女性 33 名,平均年龄 11.70 ± 0.52 岁,平均受教育年龄 6 年。选取被试前与项目指导老师及小学老师进行了测量量表的讨论,认为该测量不会对小学生造成身体和心理的伤害。

(三)实验材料

采用笔者自行编制的“人口学问卷”以及“Spence 儿童焦虑量表”“中国儿童注意力测评量表”来评定被试的焦虑情况以及注意力情况。自行编制的“人口学问卷”主要用于收集被试的人口学信息,具体包括性别、年龄、年级、成绩、性格、是否为独生子女、与绿色植物的接触程度、家庭状况、同伴关系,便于进行被试情况的统计。“Spence 儿童焦虑量表”包括分离焦虑、躯体伤害恐惧、社交恐惧、恐慌障碍、强迫性神经症障碍以及广泛性焦虑 6 个维度,该量表采用五点记分方法,将各维度得分总和的平均分作为焦虑症状的得分,得分越高,表明焦虑问题越严重。量表重测信度为 0.70,内部一致性信度为 0.86,具有较高的有效性。“中国儿童注意力测评量表”共 15 道题目,按 1~3 级记分,最后得分在 35~45 分,表明注意力很好,记为 A 等,25~

34分表明注意力基本上能够维持日常学习和生活的需要,记为B等,15~24分表明注意力亟待提高,记为C等。

(四) 实验程序

主试给被试发放“人口学问卷”“Spence儿童焦虑量表”“中国儿童注意力测评量表”3份问卷,并向被试说明问卷的填写方法,要求被试尽可能快地完成问卷的填写。

(五) 数据分析方法

采用SPSS 23.0软件进行统计分析,采用方差分析、相关分析和回归分析,以 $p < 0.05$ 作为统计意义上具有显著差异的标准。

(六) 结果

1. 描述统计

本次调查共回收注意力测验有效问卷65份(见表1),其中注意力优秀水平(A等)占比84.6%,注意力一般占比15.4%,没有出现注意力有缺陷的被试。回收焦虑测验有效问卷共59份,根据“Spence儿童焦虑量表”在中国的常模^[54],有9名被试的焦虑总分异常偏高,检出率为15.3%,见表2。

表1 被试注意力状况

	频率	平均值±标准差
A等	55	39.15±2.62
B等	10	30.30±2.54
C等	0	
总计	65	37.78±4.13

表2 被试焦虑状况

	平均值±标准差
广泛性焦虑	3.66±3.10
强迫障碍	3.85±3.15
恐慌障碍	3.82±3.89
躯体伤害	3.76±2.85
社交恐惧	4.18±3.17
分离焦虑	2.35±2.36
焦虑总分	20.86±14.88

2. 推论统计

为了考察小学生注意力和焦虑的影响因素,以人口学因素为因子,分别对注意力和焦虑总分进行单因素方差分析,结果表明:不同家庭环境下的注意力水平有显著差异, $F(2, 62) = 4.89, p < 0.05$ 。LSD结果显示,“家庭和睦”和“家庭偶有摩擦”条件下小学生的注意力水平显著高于“常有矛盾”条件;不同

绿色植物接触程度下的焦虑水平有显著差异, $F(2, 56) = 3.35, p < 0.05$,由于满足“没有接触”条件的被试太少,无法进行事后比较。

为了考察注意力与焦虑的关系,对其进行相关分析和回归分析。先对注意力和焦虑总分做K-S正态性检验, $p < 0.05$,二者都为非正态分布。进行斯皮尔曼相关分析, $r = -0.44, p < 0.05$,注意力和焦虑存在显著负相关,即注意力水平越高,焦虑值越低。同样也发现注意力与焦虑的每一个维度都存在显著负相关($r < 0, p < 0.05$)。

在回归分析前对焦虑总分进行对数转化,转化后的K-S正态性检验结果显示 $p > 0.05$,为正态分布。以焦虑总分作为因变量,注意力水平作为预测变量,采用一元线性回归法进行分析,结果详见表3。回归方程及系数显著,表明注意力能够显著负向预测焦虑。

表3 注意力对焦虑的回归分析

$F(df)$	p (回归方程)	R^2 (调整后)	β (标准化)	t	p (回归系数)
11.01(1)	0.002	0.15	-0.41	-3.32	0.002

(七) 讨论

上述统计结果表明,受测小学生们注意力水平良好,大多处于中上水平。“Spence儿童焦虑量表”的计分结果显示,与中国的常模相比,存在9个焦虑值异常偏高的情况,说明小学生们确实存在焦虑问题,与前人的研究和本实验的假设一致。

进一步分析表明家庭环境对注意力水平有影响,绿色植物接触程度对焦虑有影响。虽然由于只存在一例没有绿色接触的情况而无法得出确切的结论,但可以明确的是,随着绿色接触程度的提高,焦虑值会有降低的趋势,这一发现同样符合本研究的实验假设即园艺疗法能够降低焦虑。回归分析的结果表明,注意力对焦虑具有显著的负向预测作用。根据本研究提出的理论模型,注意和焦虑是相互影响、相互作用的关系,注意力可以作为园艺疗法的中介机制去影响焦虑。研究一的发现为理论模型的论证提供了有力的支持,初步说明了园艺疗法、注意、焦虑三者之间的关系,为后续实验打下了坚实的基础。

在实际测验中,研究者发现“中国儿童注意力测评量表”具有社会赞许性的倾向,被试们倾向于选择符合父母和老师所期望内容的选项,因此可靠性较低。在后续研究中将采用更具操作性的方法来测量注意力,提高研究的效度。

三、研究二：园艺团体辅导 对小学生的心理干预

(一) 研究目的

研究二通过设计园艺团体辅导方案,以小学生为研究对象,探讨园艺疗法在对小学生的干预中起到的对焦虑与注意力的积极作用。同时研究还将探讨在干预过程中,园艺疗法、焦虑与注意三者之间的内在关系及相互作用机制,用以验证研究所提出的“园艺疗法—注意力—焦虑”模型的合理性。

(二) 被试

研究二于2019年11月至2020年1月进行,选取了某小学的40名小学生参与实验研究,剔除5份无效数据,剩余35名被试的数据进入统计分析。其中30名为实验组,男女各15名,总体平均年龄为 10.11 ± 1.13 岁,受教育年限平均值为 4.66 ± 0.97 年,在三点量表中表现出的绿色植物接触平均得分为 1.51 ± 0.61 ,处于较低水平。其余5名则为对照

组,男生3名,女生2名。选取被试前与项目指导老师及小学老师进行了测量量表以及园艺辅导方案的讨论,认为该研究不会对小学生造成身体和心理的伤害。

(三) 实验材料

研究二在前测和后测部分采用了研究1中使用的“人口学问卷”“Spence儿童焦虑量表”以及“舒尔特方格”来对园艺疗法的效果进行考察。其中“舒尔特方格”的测量方法是让被试用最快的速度单手点数1~16个数字,同时出声读出数字。“舒尔特方格”的常模显示,本次研究中被试年龄范围内7~12岁儿童的测验成绩小于26s为优秀,大于等于26s、小于42s为良好,大于等于46s、小于50s为中等,大于等于50s则为较差。

(四) 实验设计

本研究采用实验组-对照组前后测设计,实验组接受8次园艺活动,对照组不参与园艺活动。本研究的实验设计如表4所示。

表4 园艺疗法干预前后测设计

组别	前测	实验处理	后测	跟踪
实验组	人口学问卷、Spence儿童焦虑量表、舒尔特方格、房-树-人绘画测验	园艺疗法	Spence儿童焦虑量表、舒尔特方格	个体访谈
对照组	人口学问卷、Spence儿童焦虑量表、舒尔特方格、房-树-人绘画测验	不作处理	Spence儿童焦虑量表、舒尔特方格	

园艺疗法具体以园艺团体辅导的形式开展,园艺团体辅导的单元设计如表5所示。团体辅导以焦虑和注意力相关理论为主要基础,以达到以下目标:一,放松身体,投入到园艺疗法活动当中,感受园艺活动的乐趣,体验积极情绪,降低焦虑;二,认真参与园艺活动,积极动手,创作属于自己的园艺作品,与同伴互助、分享等,提高参与活动的注意力水平。

(五) 园艺疗法开展的保障

1. 实验场地

本研究主要在室内活动场所开展,是该小学托管班的活动室。

2. 时间安排

项目选择在每周一、周四下午该小学托管班的活动时间进行,若遇到节假日或大型活动,则园艺疗法活动顺延一次,共开展了8次活动,每次活动60 min。

3. 项目选择

依据现有的时间空间条件,遵循方便活动开展的原则,主要选择动手设计类的精巧性活动,以满足学生们亲自动手操作的需求,增加活动趣味,增强学生们参与交流的兴趣。该活动方案由浅入深,先营造进入园艺活动的节奏与氛围,到与鲜花植物

的亲密接触,再到园艺活动的延展,环环相接。活动内容包含视觉、听觉、触觉、嗅觉和味觉,让学生们全方位、多角度地感受园艺活动的趣味,更自然地融入到活动中,以获得更好的活动体验,达到活动目标。

(六) 数据分析方法

采用SPSS 23.0软件,比较焦虑值和注意力水平的实验组前测与对照组前测差异、实验组前后测差异、对照组前后测差异、实验组后测与对照组后测差异,以 $p < 0.05$ 作为差异显著的标准。采用Bootstrap对注意进行中介检验,探究其在园艺疗法影响焦虑的过程中所起的作用。

(七) 结果

1. 差异显著性非参数检验

由于实验组与对照组的被试数量较少,不能形成正态分布,因此研究2将采用非参数检验的方法对两组数据的组间及组内差异进行比较。

研究二首先对实验组与对照组的前测组间差异进行了独立样本的非参数检验,采用Mann-Whitney U检测方法来检验两组数据的差异显著性,其检验结果见表6。检测结果显示 $p > 0.05$,两组的组间差异不显著,可以进行接下来的研究。

表 5 园艺团体辅导单元设计

次数	活动主题	活动内容	活动目标
1	绿色大结盟	介绍园艺活动 团队契约 进行注意力和焦虑的测量	适应环境、了解活动 建立团体关系, 以提供社会支持, 增强归属感 建立团队规范
2	潜心绘叶脉	团队公约巩固(签名) 分组 细画叶脉 个人作品展示	加强团队意识 提升注意力 增强自我效能感 通过观看叶片降低焦虑
3	动手造花园	分组 微景观花园生态瓶制作展示 分发材料 个人作品展示	增强合作和互动 增强注意定向的执行能力 提高学生的创造力 在接触土壤、花草过程中缓解焦虑 增强自我效能感
4	插花传美意	分组 介绍插花活动及制作 讨论设计 分发材料 制作 个人作品展示	增强团队合作意识 集中注意力 合作互动, 激发创造力和提高交流能力 提高注意力, 缓解焦虑 增强自我效能感
5	自然收藏家	书签展示及制作方法讲解 分发材料 制作 个人作品展示	集中注意力, 学会方法 激发创造力 提高注意力, 缓解焦虑 增强自我效能感
6	芬芳装香包	香包展示及方法讲解 分发材料 制作 个人作品展示	集中注意力, 学会方法 激发创造力 提高注意力, 缓解焦虑 增强自我效能感
7	缤纷水果宴	分组 介绍水果拼盘活动及如何制作 分发材料和工具 制作 个人作品展示 成品享用	增强团队合作意识 集中注意力, 学会方法 合作互动, 激发创造力和交流能力 提高注意力, 缓解焦虑 增强自我效能感
8	别绿约再期	全程活动总结 宣告活动结束 注意力和焦虑的再测 访谈	增强自我效能感 回忆全程 结束活动

表 6 实验组、对照组前测数据差异比较

	实验组(<i>n</i> =30)		控制组(<i>n</i> =5)		Mann-Whitney <i>U</i>
	平均值	标准差	平均值	标准差	
注意力水平	47.30	11.52	45.57	12.81	0.837
焦虑水平	92.50	27.07	68.60	26.17	0.185

其次, 研究考察了实验组与对照组两组的组内前后测差异, 并用 Wilcoxon 符号秩检验进行数据分析。其中, 实验组的前后测组内差异分析见表 7, 对照组的前后测数据差异分析见表 8。由表 7 可知, 实验组注意力与焦虑值的前后测数据存在显著差异($p < 0.05$), 后测数据均值均小于前测数据。由表 8 可知, 对照组的前后测数据不存在显著差异($p > 0.05$)。

表 7 实验组前后测 Wilcoxon 符号秩检验结果分析

	前测(<i>n</i> =30)		后测(<i>n</i> =30)		Wilcoxon 符号秩检验	
	平均值	标准差	平均值	标准差	<i>z</i>	<i>p</i>
注意力水平	47.30	11.52	39.98	9.27	-2.83	0.005
焦虑水平	92.50	27.07	79.73	25.09	-3.80	0.000

表 8 对照组前后测 Wilcoxon 符号秩检验结果分析

	前测(<i>n</i> =5)		后测(<i>n</i> =5)		Wilcoxon 符号秩检验	
	平均值	标准差	平均值	标准差	<i>z</i>	<i>p</i>
注意力水平	45.57	12.81	44.42	13.93	-1.21	0.225
焦虑水平	68.60	26.17	65.60	26.24	-1.36	0.176

最后, 研究对实验组与对照组的后测数据进行 Mann-Whitney U 检验, 结果见表 9。实验组与对照组在后测的两项数据中差异并不显著($p > 0.05$)。因此实验组与对照组的后测数据之间不存在显著差异。

表 9 实验组、对照组后测数据差异比较

	实验组 ($n=30$)		对照组 ($n=5$)		Mann-Whitney U p
	平均值	标准差	平均值	标准差	
注意力水平	39.98	9.27	44.42	13.93	0.369
焦虑水平	79.73	25.09	65.60	26.24	0.321

2. 中介模型检验

首先, 使用 Hayes 编制的 process 插件, 以 Model 4 为简单的中介模型^[55], 在控制性别、年龄和班级的情况下对注意力在园艺疗法与焦虑之间关系的中介效应进行检验(见表 10)。结果表明, 园艺疗法对焦虑的作用不显著($B = -0.56, t = -1.12, p > 0.05$)。当加入中介变量(注意力)后, 园艺疗法对焦虑的直接预测不显著($B = -0.58, t = -1.11, p > 0.05$), 园艺疗法对注意力的预测不显著($B = 0.58, t = 1.16, p > 0.05$), 注意力对焦虑的预测也不显著($B = 0.03, t = 0.17, p >$

表 10 注意力的中介模型检验

回归方程($n=35$)		拟合指标			系数显著性	
结果变量	预测变量	R	R^2	$F(df)$	B	t
焦虑		0.30	0.09	0.76		
	年龄				-0.15	-0.42
	性别				-0.18	-1.03
	班级				0.27	0.76
	园艺疗法				-0.56	-1.12
注意力		0.31	0.10	0.81		
	年龄				-0.28	-0.78
	性别				-0.21	-1.18
	班级				0.30	0.84
	园艺疗法				0.58	1.16
焦虑		0.31	0.09	0.60		
	年龄				-0.14	-0.38
	性别				-0.17	-0.95
	班级				0.26	0.71
	注意力				0.03	0.17
	园艺疗法				-0.58	-1.11

注: 模型中各变量均采用标准化后的变量代入回归方程

0.05)。此外, 园艺疗法对焦虑的直接效应 bootstrap 95% 置信区间的上、下限不包括 0, 说明直接效应显著; 但注意力的中介效应的 bootstrap 95% 置信区间的上、下限包括 0, 说明中介效应不显著(见表 11)。

表 11 总效应、直接效应及中介效应的分解表

	效应值	Boot标准误	Boot CI 下限	Boot CI 上限
总效应	-9.41	5.10	-18.98	1.03
直接效应	-9.72	5.03	-20.38	-0.16
注意控制的中介效应	0.31	2.61	-3.94	6.86

(八) 讨 论

1. 园艺疗法对注意力和焦虑具有显著效果

园艺疗法是一种自然辅助疗法, 在许多研究中, 研究者将其作为一个变量, 来考察其对个体的生理和心理的影响, 而亲生命假设、压力恢复理论、注意力恢复理论为这种积极作用提供了理论基础。其中, 以小学生为被试的研究中, 研究结果表明园艺疗法在小学生的自我概念、幸福感、价值观、自律水平等方面起到了积极作用^[28, 31-32]。本研究只研究了园艺疗法对小学生焦虑与注意的影响以及三者之间的作用模式, 未来的研究可以继续探讨园艺疗法对其他人群的其他心理特质或生理指标的作用以及园艺疗法的作用机制, 以丰富现有的研究成果。

根据本研究的非参数检验数据分析结果, 在焦虑值的降低上, 组内水平上, 园艺疗法对小学生的焦虑值下降起显著作用。除本研究外, 许多研究均表明园艺疗法对个体降低血压、激活副交感神经系统、缓解压力、降低焦虑、产生愉悦的心情等均起到了积极的作用^[34-36], 这包含了生理与心理两方面的效果。

同时, 在注意力方面, 在组内水平上, 园艺疗法对小学生的注意力提高起显著作用。基于注意力恢复理论^[6], 一些其他研究也使用自然元素作为自变量, 发现植物可以恢复人们的注意力^[45], 还可以提高多动症儿童的注意力水平^[29]。

但是在组间水平上两组被试的后测数据均没有显著差异, 说明园艺疗法的作用并不显著。可能的原因是实验组与对照组的前测数据并没有达到较高的同质水平, 导致两组间的前后测数据差异值主要集中在了前测的部分, 而没有体现在后测上。另一个可能的原因是对照组的被试数量过小, 影响了实验组与对照组之间的数据匹配。

2. 注意力作为中介效果不显著

大量研究表明, 园艺疗法能够显著降低焦虑^[42-43], 同时也有助于注意力的提高^[44]。在一些研究中发

现,可以通过提高注意力来降低焦虑^[47]。因此本研究在注意资源理论的基础上,提出了“园艺疗法—注意力—焦虑”模型,认为注意力在园艺疗法对焦虑的作用中作为中介变量存在。但本研究的中介检验结果并不显著,针对该结果,笔者认为可能是由于实验现实性的原因,使得实验组和对照组样本量差异过大,因而无法验证中介变量。

3. 对照组样本量略少

本研究中,对照组的样本量带来的影响可能表现在:首先,样本量略小的情况下,发生第二错误的概率会更大,降低统计效能。其次,实验组样本量是对照组的6倍,样本比例不平衡,这样大的差异会在一定程度上有违均衡原则,降低结果的可靠性。样本差异可能会使对照组数据不具有代表性。对照组较少的样本量可能使得该组所包含的特征过少,很难提取出规律,使用此数据建立起的模型,准确性也会降低。最后在中介检验中,对照组的样本量缺少,可能会使该类变量下的潜在因素变多,使得中介检验结果受到混合因素的影响,产生较大的偏差。同时在样本量较少时,中介效应估计的误差方差会较大。尤其对等级数据来说,若想要得到更为准确的参数估计,对样本量的要求会更高。因此,在未来实验中,需要加大样本量,并且严格对实验组和对照组的样本进行控制,以提高统计效度,更加客观和严谨地验证中介模型是否成立。

四、研究三:园艺疗法作用于焦虑的质性分析

(一) 研究目的

研究三基于研究二在实施园艺团体辅导过程中所得有关绘画分析、观察和访谈的结果,对数据整理后,分析园艺疗法对小学生焦虑的干预效果,探究园艺疗法的内在作用机制。

(二) 研究方法

1. 绘画分析法

在团辅开始前对实验组的学生进行房-树-人绘画测验,参考《心理画》^[56]一书对其心理状态进行分析。根据心理分析结果筛选出有焦虑症状的焦点个体,在团辅过程中进行持续重点的关注。

2. 观察法

在征求学生和学校同意后对团辅过程进行拍照记录,以电子档案的形式保存并在分析讨论的时候作为研究材料。

3. 访谈法

结合前测数据分析结果、绘画分析结果以及观察记录、园艺作品等资料,选择具有代表性的成员

进行个体访谈。访谈之前告知被试需要录音和访谈目的,访谈过程围绕与研究目的相关的10项内容展开,访谈结束后将录音转化为文本并按条目整理分析。

(三) 结果

共采访实验组被试18名,收集到被试的房-树-人绘画30份,根据《心理画》^[56]一书中所述标准,判定6名被试有焦虑倾向。

(四) 分析

1. 园艺活动能够给人带来愉悦的心情

根据研究者的观察,在园艺活动的过程中,活动室内总是充满了学生的笑声,绝大多数学生都表现得十分投入和开心。有人因为好看的花朵而开心,有人因为完美的作品而开心,还有人因为一些搞笑的意外而开心。在活动结束后的访谈中,学生们也都真诚地表达了活动过程中“激动”“开心”的内心感受,进一步验证了园艺疗法能够给人带来愉悦的心情。

2. 园艺活动能够提高解决问题能力

访谈结果显示,参加园艺活动使得学生们的动手能力有所提高,在遇到问题时多数人会选择向身边的同学寻求帮助。以团辅形式发挥作用的园艺疗法非常强调动手能力和团队合作,植物的娇嫩要求学生细心、灵巧地进行操作,园艺手工的多样性则要求学生充分发挥想象力和创造力。在这个以小组为单位互相帮助、共同进行的实践过程中,学生们的问题解决能力也就因此而逐渐提升了。

3. 园艺活动能够提升注意专注程度

数据分析结果显示,园艺团辅活动能够显著提升注意力。结合访谈结果,大多数学生表示自己能够集中注意力专注于活动本身。园艺活动具有任务性质,学生们在创作园艺作品的过程中需要注意力的投入。这种注意力不同于在学习时使用的消耗能量的有意注意,而是一种无意注意。在亲近植物的过程中,学生们感觉有兴趣,觉得被吸引,不需要消耗大量的能量就能够集中注意力,并且还能够缓解有意注意消耗带来的疲劳。正如访谈中刘同学所说的“感觉自己上课的时候注意力会比之前好一点儿”,进一步说明了园艺疗法能够产生提高注意力的效果。

4. 园艺活动能够缓解焦虑

通过观察房-树-人绘画测验分析结果和前测焦虑值统计筛选出的个体,发现这些个体在活动过程中非常投入,常常保持着愉悦的情绪,并认为自己各方面的状态都有所改善。专注于园艺活动,能够使学生们暂时地远离烦恼,并且在活动结束后的一段时间内保持更轻松的状态。长时间有规律地参加

园艺活动,集中注意力,不断学会自我放松,就能够达到减轻压力、缓解焦虑的目的。

5. 园艺疗法的效果得到认可

访谈过程中不少同学表示,这次园艺活动拉近了自己与绿色植物的距离,重新认识和体会了其价值与魅力,感觉自己“知识面扩大了”“动手能力提高了”。钟同学更表示“以后有这样的活动还想参加”,这些都说明园艺疗法的效果在学生们心中得到了认可。更为重要的是对其在缓解焦虑方面效果的认可,使得园艺疗法的价值不再只是以单薄的数据形式呈现,而是植根于研究者及参与者心中。

五、综合讨论

(一) 创新之处

从目前已有的研究来看,国内关于园艺疗法的干预和研究大部分都是针对老年人群体、大学生群体和精神病患者,而对年龄较小的身心健康的小学生群体的研究却相对匮乏。本研究针对小学生群体在学习生活中最容易出现的“焦虑”以及“注意力”这两个问题进行研究,将园艺疗法的理论和实践与实际存在的问题相结合,丰富了我国园艺疗法的理论与应用。

结合心理学与园艺学的相关知识,研究者创新设计了针对小学生焦虑降低以及注意力提高的园艺疗法团体辅导方案,探究了园艺疗法对焦虑影响的内在作用机制并验证了其效果的显著性。

园艺疗法对焦虑的作用建立在对小学生注意力的恢复上,是通过提高注意力来缓解焦虑情绪的,过往的研究发现了园艺疗法对焦虑和注意力的作用,但并未将其联系起来挖掘内在关系。本研究的结果可以为前人的相关研究提供一种新的解释方法,以联系而非独立的角度看待自然对人的影响,更全面地认识人与自然的亲密和谐关系。

本研究所设计的园艺治疗团体辅导方案为小学心理辅导和心理健康教育的发展提供了具体可操作的范本,为学校心理健康教育提供了新视角,可以满足现阶段小学课程的多样化需求。

(二) 研究推广与运用

校内心理辅导老师或校外心理咨询机构可以在小学校园内开展园艺疗法团体辅导课,以“线下+线上”两种模式进行。可以以本研究所采用的园艺疗法团体辅导方案为基础,根据校园内园艺操作场地和师生的实际情况,因地制宜地设计出有效的、多维的跨地域、跨时间的园艺疗法团辅方案。如以本研究的团辅方案为例,“线下”模式增加多肉种植园、插花和微景观等可以使学生真实接触绿色植物

的手工活动,并且可以适时地提高活动开展频率,延长活动时间,丰富活动内容,注重活动开展的有序性和连贯性,为未来的研究提高外部效度。同时增加“线上”模式的园艺疗法团体辅导云活动,依托“互联网+”技术和云端平台,以大数据和云计算为测量工具和指导,不仅可以提高未来园艺疗法研究的内部效度,还会打通老师、学生、校园三者之间因自然或人为原因而导致的空间障碍,构建一个全新的“互联网+”园艺生态体系,定点定向推出一系列的园艺制作教学的活动直播和互动问答。

以服务教学机构和学校为导向,以移动端APP和PC端为搭载平台,以新型信息基础设施为基石,构建新型心理基础设施架构,可以利用“线上+线下”的协同模式,将园艺疗法作为To C产品(面向用户的产品,此处用户可为小学生),将移动端APP或PC端软件生态作为To B产品(面向企业的产品,此处可为学校或其他教辅机构),扩大园艺疗法在教学机构的覆盖面,提高协同协作的效率,更好地服务于学生和教学机构。同时将国内外园艺疗法的理念和实践进行优化整合并最终达到本土化发展,进一步增强中国园艺疗法的影响力并逐步扩展国际协作,提高园艺疗法课程的专业性和多元性。

(三) 研究不足与改进

园艺团体辅导方案的实施操作对研究结果有重大影响。在本研究中,园艺团辅活动存在以下不足:

第一,由于主试是大学生,对于如何指导小学生被试活动缺乏经验,因此在活动中出现了人员控制混乱的场面。第二,由于在活动中实行的是自由选择材料的方式,导致了被试争夺材料的情况出现,有可能影响活动的效果。第三,由于活动时间接近期末,在整体活动进程中,有一至两周的活动间断。第四,由于场所的局限性,使得注意力测试和焦虑问卷填写时的环境都是较为嘈杂的。最后,也是因为环境局限,使得活动的分组方式为就近分组,而该活动全体成员并不是同一班级甚至不是同一年级,由于亲疏程度的差异,可能在某种程度上影响活动效果的差异性。

就以上不足,在未来活动中可以有以下的改进。首先,在活动之前,对主试先进行团辅培训,以便能在活动过程中注意活动情况和进程的把控。其次,充分且多样地准备活动材料,采用平均分配的方式对材料进行分配。第三,尽量对全程活动的时间做好连续性的安排,避免活动中断的情况发生,保证团辅活动的效果。第四,保证施测环境的安静,注意力测试和焦虑情况的测量需要在无干扰的环境下进行,否则无法得到准确的结果。最后,尽可能进

行随机分组, 以确保活动效果基本一致, 以及前后差异是由活动本身带来的, 而不是其他的因素。

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Effects of Cognitive Behavioral Therapy on Cyberchondria: A Case Study

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Abstract: Objective: To investigate the effects of cognitive behavioral therapy on cyberchondria. Methods: A participant received 8 times cognitive behavioral therapy. The cyberchondria scale(CS) and The Short Health Anxiety Inventory(SHAI) were completed pre and post treatment. Results: Data indicated that CS and SHAI were reduced from pre to post intervention. The participant reported the symptoms relieved. Conclusion: Cognitive behavioral therapy may be helpful to decrease cyberchondria.

Key words: Cognitive behavioral therapy; Cyberchondria; Case studies

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以认知行为疗法降低网络疑病程度的个案干预研究

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教育部司局函件

教社科司函〔2024〕1号

教育部社科司关于2023年度教育部哲学社会科学研究 后期资助项目立项通知书

北京林业大学杨智辉：

您申报的《大数据时代的网络社会心态研究及应用》课题，经组织专家评审并经公示，正式批准为2023年度教育部哲学社会科学研究后期资助一般项目。

项目批准号：23JHQ079。批准经费：10万元，其中第一期拨款8万元，剩余经费于最终成果鉴定合格后拨付。项目经费实行规范的预决算管理，请按照《高等学校哲学社会科学繁荣计划专项资金管理办法》（财教〔2021〕285号），严格执行国家有关科研经费管理制度，合理合规使用经费，提高经费使用效益。

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附件：评审专家对研究工作的建议



国家自然科学基金资助项目批准通知

（预算制项目）

杨智辉 先生/女士：

根据《国家自然科学基金条例》、相关项目管理办法规定和专家评审意见，国家自然科学基金委员会（以下简称自然科学基金委）决定资助您申请的项目。项目批准号：72271030，项目名称：蓝绿时空格局对居民社会适应的影响机制研究——以北京市为例，直接费用：44.00万元，项目起止年月：2023年01月至2026年12月，有关项目的评审意见及修改意见附后。

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附件：项目评审意见及修改意见表

国家自然科学基金委员会

2022年9月7日

附件：项目评审意见及修改意见表

项目批准号	72271030	项目负责人	杨智辉	申请代码1	G0106
项目名称	蓝绿时空格局对居民社会适应的影响机制研究——以北京市为例				
资助类别	面上项目		亚类说明		
附注说明					
依托单位	北京林业大学				
直接费用	44.00 万元		起止年月	2023年01月 至 2026年12月	
通讯评审意见： <1>具体评价意见： 一、该申请项目所关注的科学问题是否源于多学科领域交叉的共性问题，具有明确的学科交叉特征？请详细阐述判断理由并评价预期成果的科学价值。 该申请项目旨在研究蓝绿时空对居民社会适应的影响机制，所关注的科学问题是源于多学科交叉的领域，具有一定的学术价值。 二、请针对学科交叉特点评述申请项目研究方案或技术路线的创新性和可行性。 该项目研究方案运用多学科研究方法，具有一定的创新性和可行性。 三、请评述申请人与/或参与者的多学科背景和研究专长。 申请人/参与人具有多学科背景，研究专长较为互补。 四、其他建议 研究团队中教师人数略少；建议说明研究1和研究2使用不同的社会适应测量工具的原因；建议补充研究2的理论模型和研究假设。 <2>具体评价意见： 一、该申请项目所关注的科学问题是否源于多学科领域交叉的共性问题，具有明确的学科交叉特征？请详细阐述判断理由并评价预期成果的科学价值。 本项目融合多学科知识，揭示蓝绿自然空间与社会适应之间的作用规律，研究结论对于城市规划和建设提供实证证据，对于我国城市绿色发展和提升居民福祉具有重要意义。 居民福祉的影响因素，不仅是自然意义上的，也是社会意义上的。作者自然空间的视角切入，但运用社会适应理论解释，同时，综合运用人文社会科学领域研究方法（如实证研究等）与自然科学研究方法（遥感数据、机器学习等）对研究主题开展研究，较好地体现了共性导向、交叉融通的特征。 二、请针对学科交叉特点评述申请项目研究方案或技术路线的创新性和可行性。 研究问题具体、清晰，研究内容层层递进，尤其是研究方案具体详实，可行性明显。 在研究内容上，建议申请人考虑： 社会适应更多是社会建构意义上的，其影响因素众多，城市空间环境仅是影响居民社会适应的一个小的。如果能更多地论证城市空间环境对居民社会适应的关键性价值。研究的实践价值将更明显。 三、请评述申请人与/或参与者的多学科背景和研究专长。 申请团队三位成员（含申请人）的教育背景均为心理学领域，如果有城市规划、建筑设计、地理测量方面的专家参加，项目研究实力将更有保障。 四、其他建议 <3>具体评价意见： 一、该申请项目所关注的科学问题是否源于多学科领域交叉的共性问题，具有明确的学科交叉					

特征？请详细阐述判断理由并评价预期成果的科学价值。 该研究的主要内容是对自然环境对居民身心健康水平和社会适应水平。符合国家倡导的人民幸福、绿色环保、可持续发展的重要方向。 该研究是一个有价值的跨学科研究，结合了生态学、心理学的核心方法，采用客观量化的大数据分析，实证研究、以及干预方法，系统探究蓝绿空间与社会适应、心理健康之间的关系。研究结果可以服务于我国城市绿色发展于提升居民福祉的战略目标。 申请人在这个领域的科研基础扎实，研究设计清晰合理，研究进度设计完善。 建议优先资助。 二、请针对学科交叉特点评述申请项目研究方案或技术路线的创新性和可行性。 三、请评述申请人与/或参与者的多学科背景和研究专长。 四、其他建议 <4>具体评价意见： 一、该申请项目所关注的科学问题是否源于多学科领域交叉的共性问题，具有明确的学科交叉特征？请详细阐述判断理由并评价预期成果的科学价值。 基于多学科研究时空格局对居民社会适应的影响机制，有一定的理论与实际的意义。时空格局如何影响居民社会适应，还需加强文献支撑与理论支持。 二、请针对学科交叉特点评述申请项目研究方案或技术路线的创新性和可行性。 研究方案还需进一步完善。研究方案中如何操控其他变量对研究结果的影响？如蓝绿空间附近的居民，可能相比其他区域的人收入水平要高，社会适应本身也好。 三、请评述申请人与/或参与者的多学科背景和研究专长。 有一定的多学科前期研究基础。 四、其他建议 <5>具体评价意见： 一、该申请项目所关注的科学问题是否源于多学科领域交叉的共性问题，具有明确的学科交叉特征？请详细阐述判断理由并评价预期成果的科学价值。 本项目关注居民对城市自然空间的社会适应问题，属于多学科领域（地理学科、环境心理学、公共管理等）的交叉共性问题，具有明确的学科交叉特征。项目采用采用多学科的相关理论知识和研究方法，系统性、复合性和创新性强，试图解释居民社会适应的基本心理和行为规律。研究结果和结论有望为城市规划和建设提供参考意见，有助于服务我国城市绿色发展与提升居民幸福感的战略目标。 二、请针对学科交叉特点评述申请项目研究方案或技术路线的创新性和可行性。 三、请评述申请人与/或参与者的多学科背景和研究专长。 四、其他建议 修改意见： 管理科学部 2022年9月7日
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项目编号: 2019RW14

中央高校基本科研业务费专项资金项目

结题报告

财务账号

200/GK122001210

200/GK121901304

项目类别: 人文社科振兴

项目名称: 基于生态文明视角的园艺疗法在儿童青少年身心
健康中的作用

项目负责人: 杨智辉

所在单位: 北京林业大学人文学院 (盖章)

联系电话: 13621043150

起止时间: 2019年4月1日-2021年3月1日

填写日期: 2021年3月24日

北京林业大学

2016年修订

三、审核意见表

项目负责人承诺：

我所承担的项目（项目编号：2019RW14 名称：基于生态文明视角的园艺疗法在儿童青少年身心健康中的作用）结题报告内容填写实事求是，数据详实。

项目负责人签字：

杨新

2024年3月29日

项目负责人所在学院（单位）审查意见，是否同意结题：

（对项目负责人是否按计划任务书中的承诺完成任务审核把关）

同意

学院（单位）负责人亲笔签字：

李媛辉

学院（单位）公章：



2024年3月29日

基本科研业务费管理工作领导小组办公室审核意见：

科技处代章：



2024年5月12日

项目委托协议书

委托方：北京市民政局（以下称为“甲方”）

地 址：北京市朝阳区工人体育场东路 20 号

受托方：北京林业大学（以下称为“乙方”）

地 址：北京市海淀区清华东路 35 号

为做好社会心理基础理论与实践应用（蓝皮书）服务项目的研究工作，明确甲、乙双方的权利义务，就甲方委托乙方进行项目研究并向乙方支付项目经费相关事宜，经甲、乙双方平等协商达成一致，特签订本协议。

第一条 委托事项

甲方委托乙方进行以下项目的研究：

1、项目名称：社会心理基础理论与实践应用（蓝皮书）服务项目

2、项目目标：开展社会心理基础理论与实践研究，为加强社会心理服务体系建设提供理论指导与实践支持

3、项目组负责人：杨智辉教授

4、甲方委派赵一达、乙方委派陈晓岩作为双方项目协调人员，负责项目事宜及内外部沟通协调。

5、研究资质要求：乙方必须具备独立开展项目研究工作的科研人员、硬件设施、研究能力和行业水准。乙方保证项目负责人须具有高级专业技术职称，并具有较强的组织协调和业务能力。

1、本协议未尽事宜，双方可协商签订书面补充协议。
补充协议与本协议不一致的，以补充协议为准。

2、本协议自双方法定代表人或授权代表签字并加盖公章之日起生效。

3、本协议一式 4 份，双方各持 2 份，每份具有同等法律效力。

4、本协议部分条款无效的，不影响其他条款的规定。

甲方（盖章）：



法定代表人或授权代表（签字）：

张青之

2022 年 6 月 1 日

乙方（盖章）：



法定代表人或授权代表（签字）：

杨智辉

2022 年 5 月 17 日

项目委托协议书

委托方：北京市民政局（以下称为“甲方”）

地 址：北京市朝阳区工人体育场东路 20 号

受托方：北京林业大学（以下称为“乙方”）

地 址：北京市海淀区清华东路 35 号

为做好社会心理基础理论与实践应用研究服务（蓝皮书）项目的研究工作，明确甲、乙双方的权利义务，就甲方委托乙方进行项目研究并向乙方支付项目经费相关事宜，经甲、乙双方平等协商达成一致，特签订本协议。

第一条 委托事项

甲方委托乙方进行以下项目的研究：

1、项目名称：社会心理基础理论与实践应用研究服务（蓝皮书）项目

2、项目目标：开展社会心理基础理论与实践研究，为加强社会心理服务体系建设提供理论指导与实践支持

3、项目组负责人：杨智辉教授

4、甲方委派赵一达、乙方委派崔伟作为双方项目协调人员，负责项目事宜及内外部沟通协调。

5、研究资质要求：乙方必须具备独立开展项目研究工作的科研人员、硬件设施、研究能力和行业水准。乙方保证项目负责人须具有高级专业技术职称，并具有较强的组织协调和业务能力。

若在履行本协议过程中发生纠纷，双方应当友好协商解决。协商不成的，任何一方可向甲方所在地人民法院起诉。

第十二条 其他

1、本协议未尽事宜，双方可协商签订书面补充协议。补充协议与本协议不一致的，以补充协议为准。

2、本协议自双方法定代表人或授权代表签字并加盖公章之日起生效。

3、本协议一式 4 份，双方各持 2 份，每份具有同等法律效力。

4、本协议部分条款无效的，不影响其他条款的规定。

甲方（盖章）：

法定代表人或授权代表（签字）：



2021 年 6 月 11 日

乙方（盖章）：



法定代表人或授权代表（签字）：

杨智强

2021 年 6 月 9 日

项目委托协议书

委托方：北京市民政局（以下称为“甲方”）

地 址：北京市朝阳区工人体育场东路 20 号

受托方：北京林业大学（以下称为“乙方”）

地 址：北京市海淀区清华东路 35 号

为做好社会心理基础理论与实践应用研究服务（蓝皮书）项目的研究工作，明确甲、乙双方的权利义务，就甲方委托乙方进行项目研究并向乙方支付项目经费相关事宜，经甲、乙双方平等协商达成一致，特签订本协议。

第一条 委托事项

甲方委托乙方进行以下项目的研究：

1、项目名称：社会心理基础理论与实践应用研究服务（蓝皮书）项目

2、项目目标：开展社会心理基础理论与实践研究，为加强社会心理服务体系建设提供理论指导与实践支持

3、项目组负责人：杨智辉教授

4、甲方委派崔筱婵、乙方委派崔伟作为双方项目协调人员，负责项目事宜及内外部沟通协调。

5、研究资质要求：乙方必须具备独立开展项目研究工作的科研人员、硬件设施、研究能力和行业水准。乙方保证项目负责人须具有高级专业技术职称，并具有较强的组织协调和业务能力。

第十二条 其他

- 1、本协议未尽事宜，双方可协商签订书面补充协议。补充协议与本协议不一致的，以补充协议为准。
- 2、本协议自双方法定代表人或授权代表签字并加盖公章之日起生效。
- 3、本协议一式 4 份，双方各持 2 份，每份具有同等法律效力。
- 4、本协议部分条款无效的，不影响其他条款的规定。

甲方（盖章）：



法定代表人或授权代表（签字）：

[Handwritten signature]

年 7 月 27 日

乙方（盖章）：



法定代表人或授权代表（签字）：

杨智峰

2020 年 7 月 27 日

- 1、本协议未尽事宜，双方可协商签订书面补充协议。
补充协议与本协议不一致的，以补充协议为准。
- 2、本协议自双方法定代表人或授权代表签字并加盖公章之日起生效。
- 3、本协议一式 4 份，双方各持 2 份，每份具有同等法律效力。
- 4、本协议部分条款无效的，不影响其他条款的规定。

甲方（盖章）：



法定代表人或授权代表（签字）：

[Handwritten signature]

2019年8月7日

乙方（盖章）：



法定代表人或授权代表（签字）：

[Handwritten signature]

2019年8月7日

课题研究委托协议书

委托方：北京市民政局（以下称为“甲方”）

地址：北京市朝阳区工人体育场东路 20 号

受托方：北京林业大学（以下称为“乙方”）

地址：北京市海淀区清华东路 35 号

为做好社会心理基础理论研究项目调查研究工作，明确甲、乙双方的权利义务，就甲方委托乙方进行课题研究并向乙方支付课题经费相关事宜，依据《中华人民共和国合同法》等相关法律法规的规定，遵循平等自愿的原则，经甲、乙双方平等协商达成一致，特签订本协议。

第一条委托事项

甲方委托乙方进行以下课题的研究：

- 1、课题名称：社会心理基础理论研究项目
- 2、课题目标：加强社会心理服务体系建设
- 3、课题组负责人：杨智辉教授
- 4、甲方委派石孟磊、乙方委派崔伟作为双方课题协调人员，负责课题事宜及内外部沟通协调。
- 5、研究资质要求：乙方必须具备独立开展课题研究工作的科研人员、硬件设施、研究能力和行业水准。乙方保证课题负责人须具有高级专业技术职称，并具有较强的组织协调和业务能力。

第二条研究课题及所有权

- 1、研究课题的主要内容：

第十条 协议解除

- 1、双方协商一致，可以解除本协议。
- 2、本协议第九条第2款、第3款、第4款对本协议解除另有约定的，应从其约定。

第十一条 争议解决

若在履行本协议过程中发生纠纷，双方应当友好协商协商解决。协商不成的，任何一方可向乙方所在地人民法院起诉。

第十二条 其他

- 1、本协议未尽事宜，双方可协商签订书面补充协议。补充协议与本协议不一致的，以补充协议为准。
- 2、本协议自双方法定代表人或授权代表签字并加盖公章之日起生效。
- 3、本协议一式4份，双方各持2份，每份具有同等法律效力。
- 4、本协议部分条款无效的，不影响其他条款的规定。

甲方（盖章）：



法定代表人或授权代表(签字)：

2021年8月30日

乙方（盖章）：



法定代表人或授权代表(签字)：

杨新峰

2021年8月31日

项目委托协议书

委托方：正岸(北京)科技有限公司（以下称为“甲方”）

地 址：北京市昌平区金域国际中心 A 座 1202

受托方：北京林业大学（以下称为“乙方”）

地 址：北京市海淀区清华东路 35 号

为做好基于 CBT 的常见心理及疫情心理干预理论与实践应用研究的研究工作，明确甲、乙双方的权利义务，就甲方委托乙方进行项目研究并向乙方支付项目经费相关事宜，经甲、乙双方平等协商达成一致，特签订本协议。

第一条 委托事项

甲方委托乙方进行以下项目的研究：

1、项目名称：基于 CBT 的常见心理及疫情心理干预理论与实践应用研究

2、项目目标：搭建常见心理问题及疫情条件下心理问题的干预的理论框架，细化框架下各问题领域的干预话术，为常见及疫情条件下心理问题的干预提供理论及实践支持。

3、项目组负责人：杨智辉教授

关于在北京林业大学建设 北京市社会心态监测中心的方案

为贯彻落实习近平总书记关于“加强社会心理服务体系

建设，培育自尊自信、理性平和、积极向上的社会心态”的要求，深化社会心态相关理论和实践的研究，提高社会心理服务的能力和水平，促进良好社会心态的形成，北京市社会心理服务促进中心在北京林业大学建设北京市社会心态监测中心（以下简称“监测中心”）。

一、监测中心的定位、建设目标和功能保障

（一）定位

监测中心是根据北京市社会心态培育和社会心理服务的需要，整合心理学、社会学、信息科学、法学、管理学和教育学等学科的优势，吸收全国相关资源，通过大数据分析和问卷调查数据分析等方法，对北京市居民的认知、情绪和行为等指标进行实时监测、预警及培育，为北京市社会心态培育和社会心理服务工作提供数据支持和政策咨询的研究机构。

（二）建设目标

1. 为培育良好社会心态提供数据基础

建立社会心态数据库，包括网络数据库和问卷调查数据库两部分，对不同主题下民众的认知、情绪、行为和需求指标进行实时监测和定期检测，为培育良好社会心态提供数据基础。

2. 为社会心理服务体系建设助力

了解群众偏好、摸清群众态度、跟进群众需求，为社会心理服务提供数据支持和理论保障，深化社会心理服务体系建设。

3. 为面向群体与社会的科学研究提供有力工具

建立社会心态数据库，为心理学、社会学、信息科学、管理学及教育学等学科的学术研究提供丰富的数据，打造便捷、高效和精确的数据共享平台。

4. 为面向个体的社会心理服务提供有效渠道

将心理干预与心理咨询技术融入数据库，在保障科学性与实用性的同时，降低心理服务成本，打通各类人群获得社会心理服务的渠道，实现心理需求进一步分流，优化社会心理服务资源分配。

（三）功能保障

1. 设施与技术支持有力

建设社会心态数据库需要配置相应的基础设施，目前已具备服务器架设、数据库运维、网络爬虫、大数据分析和深度学习等设备，并且已掌握其使用能力，能够支持设施管理以及数据库建设。

2. 学科与科研背景良好

北京林业大学应用心理学是北京市级一流本科专业，在舆情监控以及社会心态监测和分析等领域有丰富的研究成果。目前已建设具有十亿数量级规模的社会心态数据库，为北京市社会心态监测建设提供良好的基础。

3. 调查问卷信效度高

问卷调查法为心理学专业最常用的数据收集方法，在认知、情感、行为和需求等心理学方面具有大量信度和效度较高的问卷，可供本监测中心使用。

二、监测中心的经费来源及用途

监测中心的经费来源包括北京市划拨的经费、北京林业大学配套划拨的经费、监测中心申请的各类课题及承担咨询培训服务取得的经费等。监测中心经费主要用于开展课题研究、建立与维护数据库、开展学术交流与合作、举办学术会议以及中心的运转等。

三、监测中心的工作运行机制

1. 以科研项目驱动中心工作

监测中心实行“开放、创新、合作、竞争、高效、快速反应”的工作机制，将北京市居民社会心态监测作为工作的首要任务，积极争取北京市各级政府部门委托研究项目，积极开展咨询服务，为政府建言献策。

2. 建立研究成果发布及战略合作制度

监测中心充分发挥研究主力军作用，重视北京市社会心态培育和社会心理服务的相关问题，努力提高相关理论与实践的研究质量和水平，形成有特色的系列研究成果，不定期提交研究报告和媒体报道等。

本着资源共享、优势互补、联合和开放和合作共赢的原则，监测中心积极与本领域的相关研究机构、大学和各级政府部门等建立战略合作关系，共同推进社会心态的研究及成

果转化。

3. 形成学术研讨会制度

定期举办学术研讨会，一季度召开一次学术研讨会，一年召开一次学术或政策研究高端论坛，进行学术交流，持续提高研究人员学术水平，开阔研究人员研究思路 and 方向，进而使得监测中心的研究处于国内一流水平。

4. 聚合一支专兼职结合的有持续产出能力的研究队伍

监测中心实行专职研究人员和聘用兼职研究人员相结合的联合研究机制。兼职研究人员由中心聘任，签订责任、权利、利益明确且具有法律效力的定期聘任合同。

监测中心根据研究领域设置开放基金和开放课题，吸引国内外优秀研究人员。另外，监测中心积极吸收研究生和本科生参与课题研究，促进人才培养。

四、规范自律及安全保密

为更好地服务于北京市，监测中心严格自律，加强安全保密意识，按北京市的规定审慎使用信息数据，在规定范围内公开并发表研究成果，保障中心健康稳定运行。

北京市社会心理服务促进中心

2023年4月20号



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开发完成日期： 2022年04月10日

首次发表日期： 未发表

权利取得方式： 原始取得

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2022年05月25日

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软件名称： 微博文本分析软件
V1.0

著作权人： 北京林业大学

开发完成日期： 2022年04月10日

首次发表日期： 未发表

权利取得方式： 原始取得

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软件名称： 微博话题爬虫软件
V1.0

著作权人： 北京林业大学

开发完成日期： 2022年04月10日

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软件名称： 栗子心理测评平台
V1.0

著作权人： 北京林业大学

开发完成日期： 2022年04月15日

首次发表日期： 2022年04月20日

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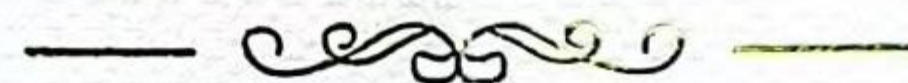
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2022年06月06日

荣誉证书

HONORARY CREDENTIAL



王思域：

您的论文《决策双系统理论视域下自然接触对跨期决策的影响：情绪与自我控制的并行中介作用》被评为北京林业大学 2023—2024 学年优秀硕士学位论文，特发此证。



北京林业大学

二〇二四年六月十八日

荣誉证书

高蕊：

在北京林业大学2023年研究生暑期社会实践中
表现优异，被评为

先进个人

特发此证，以资鼓励。

北京林业大学党委研究生工作部

二零二三年十一月

知山知水



树木树人

证书编号: PSY202386319



荣誉证书

CERTIFICATE OF HONOR

许楠、刘馨雨、赵蓬茸、周美

祝贺你们在 2023年 全国大学生心理与行为在线实验精英赛
分赛区竞赛 中, 荣获 **二等奖**

指导老师: 杨智辉、于晓

院校名称: 北京林业大学

特颁此证, 以资鼓励。

颁发日期: 2023年09月22日



中央财经大学教务处



中央财经大学社会与心理学院



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HONORARY CREDENTIAL



金思宇：

您的论文《“千禧一代”的年龄焦虑：与自尊、成就动机、人生意义感和生活满意度的关系》被评为北京林业大学 2021—2022 年度优秀硕士学位论文，特发此证。



荣誉证书

赴江西井冈山、七彩岩龙湾暑期实践团 团队：

在2021年研究生暑期社会实践及科技服务活动中表现优异，成果突出，荣获

优秀团队

特发此证，以资鼓励。

北京林业大学党委研究生工作部

二〇二一年十二月二十三日



荣誉证书

金思宇、张濯、曹伊婧、桂忻然、孟弈琳同学：

在2021年“木铎杯”在线问卷调研大赛中表现突出，所编制的量表《“千禧一代”年龄焦虑问卷》荣获：

“**院级一等奖**”

特发此证，以资鼓励。

北京林业大学人文社会科学学院

二〇二二年二月



荣誉证书

梁柯、李正仁、于欣艳、赵心涵同学：

在2021年“木铎杯”在线问卷调研大赛中表现突出，所编制的量表《网络隐私意识调查问卷》荣获：

“院级二等奖”

特发此证，以资鼓励。

北京林业大学人文社会科学学院

二〇二二年十二月

人文社会科学学院

1101081587251

北京林业大学应用心理专业学位 研究生实践基地协议

甲方：北京林业大学

通讯地址：北京市海淀区清华东路35号

邮编：100083



乙方：北京市社会心理工作联合会

通讯地址：北京市东城区前门东大街5号华风宾馆6626

邮编：100005



研究生实践基地是实现应用心理专业学位研究生培养目标的重要条件保障，也是“产学研一体化”联合培养高层次人才的重要形式。为贯彻落实国家研究生教育改革的有关文件精神，进一步推进校企深度融合，加强“产、学、研、用”有机结合，深化我校应用心理专业学位研究生培养机制改革，促进研究生培养与社会行业、企业人才需求紧密结合，切实提升研究生实践创新能力。本着优势互补、相互协作、互利互惠、共同发展的原则，经甲乙双方充分协商，就关于共建应用心理专业学位研究生实践基地达成如下协议：

一、甲方的权利与义务

1. 甲方负责对乙方申报条件进行核准，并考察乙方所能提供专业实践的专业、岗位、环境等条件，经核准同意后，甲方给乙方正式授牌（“北京林业大学应用心理研究生实践基地”）。
2. 甲方优先为乙方提供有关本专业最新研究进展和技术成果信息，并在人才培养、科学研究、科技咨询、成果转化等方面优先给予考虑。
3. 在国家政策允许范围内，甲方优先向乙方推荐有关优秀毕业生。

三、实践基地/工作站的年限

1. 研究生实践基地协议从签字日期开始生效，协议有效期为3年。
2. 协议期满后，由甲乙双方根据实际情况另行协商确定是否续签或者取消。

四、其他事项

1. 实践基地建设的形式由甲乙双方共同商定。
2. 甲乙双方根据研究生实践培养的要求，对实践基地建设、研究生实践效果与问题进行定期或不定期研讨，保证实践基地的设施能同时满足 20 名以上研究生的实践要求。
3. 甲乙双方共同探讨高层次人才培养模式，及时总结经验。
4. 甲乙双方将本着平等互利的原则，对协议中的未尽事宜和执行协议过程中出现的问题协商解决。
5. 本协议一式五份，甲方四份、乙方一份，自双方签字、盖章之日起生效。

甲方：北京林业大学

甲方代表（签字）：

公章：

签字时间：

2022.10.9

乙方：北京市社会心理工作联合会

乙方代表（签字）：

公章：

签字时间：

2022.10.8