

正念训练对冲动性不同要素的影响：基于双加工理论*

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摘 要 正念是指对当下身心体验不带有评判地觉察。基于双加工理论, 以正念为核心的训练对个体冲动性不同要素均具有明显干预效果。一方面, 有助于降低因情感系统引发的冲动驱动力: 通过调整个体的奖赏评估与预期, 缓和诱发冲动的压力与负性情绪反应, 减弱自动化反应的联结和强度; 另一方面, 提升个体由认知控制系统调节的冲动控制力: 增强个体的认知控制和行为抑制能力。由于冲动性驱动因素和控制因素二者加工时序的先后差异和作用方向对抗性特点, 正念训练促进两类要素的积极交互影响, 缩小冲动性“驱动”与“控制”力量之间的不平衡, 为个体更好地回应自身反应与外界刺激提供了有利缓冲, 是降低个体冲动性的有效干预手段。

关键词 正念训练, 冲动性, 双加工理论, 驱动因素, 控制因素

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1 引言

在心理学上, 冲动性是指个体易受一时想法影响而鲁莽行动的倾向, 通常表现出做事缺乏预见性或反思, 对自身行为结果缺乏充分考量的行为特点(Fineberg et al., 2014; VandenBos, 2015)。

冲动性是一个复杂且多维的概念(Rochat et al., 2018; Vassileva & Conrod, 2019), 不同界定和测量会影响对冲动性的理解以及冲动性行为将如何得到干预或治疗。作为一种人格特质, 冲动性不仅是影响个体行为表现的重要因素, 也是许多问题行为和精神障碍的主要特点, 如冲动购买、攻击行为、注意缺陷与多动障碍、进食障碍、反社会型人格障碍、物质使用成瘾等(American Psychiatric Association, 2013)。现实生活中, 冲动性行为的表现形式非常丰富, 可能表现为多饮一杯酒或购买并不需要的物品, 也可能表现为攻击他人或伤害自己, 以及发展出其它冒险或问题行为等。同时, 冲动性行为暂不存在唯一的神经生

物学基础(Evenden, 1999), 因此, 将个体冲动性视作受到多个不同因素相互作用以调节行为的结果, 似乎更有利于对其进行病理性解释(王鹏飞等, 2019)。

Barratt (1993)基于医学、心理、行为和社会模型提出注意冲动性、动作冲动性和无计划性的三因素模型与相应的测量工具(Barratt Impulsivity Scale, BIS); 另一观点则认为冲动性是涉及个体行为、情感和动机的复合概念, 提出冲动性包括(正、负)紧迫感(urgency)、缺乏预见性(lack of premeditation)、缺乏耐心(lack of perseverance)和感觉寻求(sensation seeking)4个因子, 形成广泛认可的 UPPS 冲动性模型(Whiteside & Lynam, 2001)。然而, 上述理论仅对个体冲动性进行外显行为特征描述与类型划分, 并没有回答影响个体冲动的不同心理动力及其之间的相互作用与变化过程。

随着冲动性研究的深入, 近年来逐渐呈现出对冲动性内部心理机制探索的关注趋势(曾红等, 2022; Dawe et al., 2004; Vergés et al., 2019)。在心理病理学上, 冲动性反应的发生被认为是个体自我监控和行为调适失败的结果(Heatherton & Wagner, 2011; Leshem & Yefet, 2019)。这一观点注重个体已有的认知控制能力, 认为是个体的控制

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能力出现问题, 因而导致无法控制的冲动性行为。但忽略了受到个体直接经验的情感和奖赏反应而诱发的动机倾向(例如, 想要接近或获取某物)在个体冲动性行为中扮演的重要内在驱动作用(Brewer, 2019; Huijbregts et al., 2008)。在此基础上, Leshem (2016)等从信息加工视角提出理解冲动性的双加工理论模型(dual-process model)。根据主导系统的不同, 冲动性分为情感冲动性(affective impulsivity)的自动化加工和动作/认知冲动性(action/cognitive impulsivity)的控制加工过程。一方面, 个体受到自下而上的自动化情绪性因素强大驱动而表现出的情感冲动性, 是个体冲动行为得以发生和维持的重要力量。这类冲动性主要受到以杏仁核(amygdala)、腹侧纹状体(ventral striatum)、腹内侧前额叶皮层(ventromedial prefrontal cortex, VMPFC)、眶额叶皮层(orbitofrontal cortex, OFC)为主要组成的情感系统(socioemotional system)相关脑区的调节, 其自动化的加工过程具有无需有意诱导、所需认知资源少、发生在意识之外且难以自发表止等特征(Gawronski & Creighton, 2013)。另一方面, 自上而下的动作/认知冲动性(action/cognitive impulsivity)受到认知控制系统(cognitive control system)的调节, 主要涉及脑区包括背外侧前额叶(lateral prefrontal cortex, LPFC)、侧顶叶皮层(lateral parietal cortex), 以及前扣带回皮层(anterior cingulate cortex, ACC)的部分位置等。这一系统主要负责抑制个体不合时宜、草率的冲动(Steinberg, 2008), 其加工过程需要意志参与和消耗大量的认知资源(Gawronski & Creighton, 2013)。因此, 个体的冲动表现可能是由情感系统过度活跃导致, 或是受到认知控制系统执行功能缺陷的影响, 亦可能是二者共同作用的结果。

在双加工系统中, 冲动性行为的发生并非是由单一系统决定的结果。如冲动性购买行为是个体经历了冲动欲望与自我控制之间冲突的结果, 当驱动欲望战胜了自我控制, 个体才会肆无忌惮去消费, 冲动性行为得以外显发生。也就是说, 即便个体冲动控制系统发展良好, 若个体情感冲动性加工存在不足, 驱动力量过大, 冲动性行为则难以避免。由此, 驱动个体的情感冲动性是影响个体冲动性的重要力量。

同时, 两类系统相关脑区间的发展不平衡或受损也可能导致特定人群的冲动性行为。研究发

现, 青少年成熟的情绪系统增强了其对新异刺激与危险行为的追求, 而发展相对滞后的认知控制系统尚无法完全抑制此类行为, 从而使青少年展现出较冲动的外在表现(Lazuras et al., 2019; Steinberg, 2008; Whelan et al., 2012)。在酒精成瘾者中, 情感系统的过度反应使自我调节受损, 两系统间不同形态失衡导致不同的临床冲动表现, 助推过量饮酒或酒精依赖 (Carbia et al., 2018; Lannoy et al., 2014; Noël et al., 2010)。对酒精线索的自动化反应过程将占用有限的注意资源, 减少其它认知加工所需资源, 对个体日常活动的正常进行造成困扰。关于网络成瘾者的研究亦支持双加工系统失衡这一解释(D'Hondt & Maurage, 2017), 而注意缺陷与多动障碍患者则在两类加工过程中均表现出不足(Capri et al., 2020)。因此, 以双加工理论为框架探索干预个体冲动性方案成为可行思路, 而以正念为核心的训练是能够回应这一理论的方法之一。

正念(mindfulness)一词源于禅宗, 强调个体以不评判的态度对当下身心状态进行有意识的体验与觉知(Kabat-Zinn, 1994; Kabat-Zinn, 2013)。正念训练既包括基于东方文化中特定信仰体系的传统冥想方法, 也包括应用于多种认知取向心理治疗方法中的现代正念干预方式(Hayes et al., 1999; Linehan, 1993; Segal et al., 2012)。正念进入科学研究视野以来, 临床工作者逐渐意识到正念训练对于降低特定人群冲动性的裨益, 开发出有针对性的正念干预项目, 包括协助物质成瘾戒断者预防复发的干预项目(Mindfulness-based Relapse Prevention, MBRP) (Bowen et al., 2021)和正念预防复发提升项目(Mindfulness-oriented Relapse Enhancement, MORE) (Garland et al., 2014), 辅助进食障碍患者进行体重控制的正念进食意识训练(Mindfulness-based Eating Awareness Training, MEAT) (Kristeller & Wolever, 2011)等。越来越多证据显示, 个体的正念特质能负向预测个体冲动性水平(Garland, 2011; Lu & Huffman, 2017; Zhang et al., 2021), 正念训练对个体冲动性行为特征呈现明显的干预效果, 包括降低注意缺陷与多动障碍患者临床症状, 减少在校学生行为问题, 避免物质成瘾者复吸, 干预流浪者负性情绪和冲动性, 改善肥胖者的进食行为以及提升少年犯的自我控制等(Cairncross & Miller, 2016; Franco et al., 2016;

Korecki et al., 2020; Maddock et al., 2016; O'Reilly et al., 2014; Ron-Grajales et al., 2021)。

一直以来,正念训练对个体冲动性产生积极影响的作用机制是研究者关注的焦点。双加工理论模型是解释个体冲动性内部机制的新进展,本文以此框架探讨基于正念的训练对个体冲动性不同要素的干预效果,阐述正念训练如何分别对冲动性的驱动因素和控制因素施加作用,进而改变整体冲动性表现的作用机制。同时,探索正念训练干预个体冲动性的未来研究与应用方向,以期后续深入研究和临床实践提供指导与参考。

2 正念训练对冲动性驱动因素的影响

在双加工系统中,情感冲动性主要受到情感系统相关脑区的调节,是自下而上的经验性情感或动机加工的结果,具体表现为对环境因素产生习惯化情绪唤起或动机反应以及刺激(奖赏)驱动的“趋-避”反应(Hofmann et al., 2009; Leshem, 2016)。正念训练试图培养个体以正向的态度充分“暴露”于“被驱动”的自身体验之中,通过逐步降低个体的奖赏预期,提升对自然奖赏的反应性,进而实现对其奖赏效应的调整和重塑。同时,正念训练提升个体对压力和负性情绪的“去中心化”(decentering)水平,降低了个体的压力和负性情绪感知水平,起到避免冲动行为发生的重要缓冲作用。更本质的是,经过正念训练,个体对自身内在感受和惯性反应的觉察更敏锐,有助于减弱冲动行为中具有自动化特征的驱动力。

2.1 正念训练降低奖赏预期,促进良性奖赏机制的重塑

奖赏效应是指个体完成某一行为,得到实质性获益反馈,之后愿意重复一次行为的表现。遵循奖赏效应是个体适应恶劣生存环境的重要策略,基于以往生活经验,个体将冲动行为与获得奖赏建立起紧密关联后,一旦注意到可产生奖赏的事物,即会出现强烈的奖赏预期驱动冲动行为发生。具有较高奖赏敏感性的个体通常表现更为冒险或欲望更强(熊素红,孙洪杰,2017;Dawe et al., 2004)。例如:暴食症患者基于个体经验,更倾向寻求食物带来的愉快体验而过度进食。作为一种相对稳定的心理生理学特征,个体的奖赏敏感性更多受到基因或成长环境的长期影响,能够正向影响个体对享乐性物质的注意偏向和冲动欲望

(熊素红,孙洪杰,2017;Davis et al., 2007)。

研究发现,正念训练使参与动机和奖赏加工的脑区功能模式发生了改变。正念训练后,参与者在静息状态下的壳核和尾状核活动更强,而相较于控制组,有经验冥想者的奖赏预期加工过程中尾状核的激活更低(Tang et al., 2015)。一项为期8周的正念进食干预前后,对被试进行任务态(两种激励延迟任务:食物线索和金钱线索)fMRI研究发现,相对于主动控制组(烹饪教育),经过正念进食干预的被试呈现出对食物线索表现出奖赏预期(reward anticipation)有关的中脑活动反应减弱,面对金钱线索时中脑活动以及与奖赏接受(reward receipt)有关的纹状体脑区反应均没有显著变化(Janssen et al., 2017)。面对奖赏预期错误(reward prediction error)反应时,与控制组相比,不论是经过短期训练者或长期练习者都表现出较弱的奖赏预期加工反应(Kirk et al., 2019),但面对初级奖赏(如食物)时后脑岛的激活程度更强(Kirk & Montague, 2015)。这种关注当下内在感受的干预方式,减少奖赏加工中预期效应的干扰,但并未影响(甚至提升)个体对奖赏刺激物直接做出反应的可能。

一方面,正念干预通过降低食物相关线索的凸显性,从而降低个体对于食物的奖赏预期,减弱寻求不良适应行为所带来的紧迫感与渴求感,进而减少过量进食等冲动行为的发生。研究发现,对过量进食的超重者进行5.5个月正念辅助进食控制训练后,相对于普通干预组,自我报告更低的受奖赏驱动进食,并可依此预测其在干预一年后的体重下降趋势(Mason et al., 2016)。此外,对40名女性分组进行正念注意引导和食物享乐属性引导的一次干预后发现,正念组参与者报告饥饿感保持稳定但满足感提升,在干预后仅进食较少的高热量食物,而对照组(享乐组)则相反,饥饿感上升,满足感维持稳定(Fisher et al., 2016)。

同时,个体对冲动性行为的渴求体验大多受到相关线索诱发,是奖赏预期水平的具体表现。一项元分析研究发现,正念训练能够中等程度降低个体对成瘾物质的渴求感(Li et al., 2017)。使用手机程序进行28天自定步调(self-paced)的正念进食干预后,个体因主观渴求而发生的进食量下降了约4成(Mason et al., 2018)。fMRI研究发现,相较于自然注视,烟草成瘾者以正念方式注视烟草

图片时,与渴求感相关脑区,如前扣带回膝下部(subgenual anterior cingulate cortex, sgACC)激活减弱,同时与控制相关的前额叶皮层(prefrontal cortex, PFC)并未出现明显的增强或减弱(Westbrook et al., 2013)。这一结果提示,这种有意的正念训练对个体渴求体验的缓和更多通过减弱“自下而上”自动化加工过程得以实现。

另一方面,正念训练有助于重新建立冲动个体对自然奖赏物(如笑脸、美景等)的奖赏反应。多种适应不良的冲动反应都与个体的奖赏机制运转失衡有关。其中,具有典型冲动特征的成瘾者认为成瘾物质/行为具有高奖赏性,因而对“回报”较低的自然刺激物失去奖赏效应(Brewer, 2019; Garland et al., 2014; 杨玲 等, 2020),即对原本令人愉快的普通事物无法产生愉快体验。这种失调的奖赏加工使个体依赖于“畸形”奖赏,一旦物质滥用的诱因出现,成瘾者表现出对成瘾物质更急迫的寻求反应。正念训练中“仔细品味”(Savoring)等觉察技术将练习者充分“暴露”于自身体验之中,同时培养其耐心和接纳的态度,试图重新建立起其对自然奖赏物的奖赏反应(Garland, 2016; Garland, 2021; Kristeller & Wolever, 2011)。研究发现,经过8周正念训练的物质成瘾者对自然奖赏物的积极评价显著提升,并在自然奖赏刺激呈现后的400~1000 ms的晚正电位上(late positive potential, LPP)与中性刺激时引发波幅的差值变大,提示对自然奖赏的奖赏反应增强(Garland et al., 2015)。吸烟者在正念训练干预后对烟草图片刺激诱发的LPP反应下降(Brown et al., 2020)。对自然奖赏物的奖赏效应提升意味着降低了成瘾物质/行为的相对高奖赏性,从而帮助矫正成瘾者存在的奖赏加工缺陷,进而降低使用成瘾物质/行为的冲动性。

2.2 正念训练调节诱发冲动的压力与负性情绪

作为引发个体冲动行为的重要诱因,压力和负性情绪体验是个体间普遍存在的不适体验(严瑞婷, 2019; Bresin et al., 2013)。生理上,压力反应受到促肾上腺皮质释放因子和其他压力激素的调节,将强化杏仁核功能,引发负性情绪状态。个体主观报告的压力水平也发现可预测紧随其后的负性情绪体验(徐慰 等, 2018),二者共同作用影响个体对冲动行为的负向紧迫感和渴求感。例如,边缘性人格障碍患者表现出冲动性与情绪问题紧

密联系的典型特点,负性情绪状态容易诱发如暴食症患者的冲动行为等(Stratton, 2006),增加主观食欲和对食物线索的注意偏向(Hepworth et al., 2010)。个体初始抑郁状态能够调节正念训练对压力反应的影响,抑郁水平低者冲动行为下降更多(Gould et al., 2012)。对物质成瘾者的MBRP研究发现,压力水平是正念训练降低个体渴求感与成瘾物质使用量的重要中介变量(Davis et al., 2018)。

研究发现,基于正念的训练对压力和负性情绪调节普遍有积极影响(Creswell et al., 2014; Davis et al., 2018; Kabat-Zinn, 2013; Xu et al., 2016)。接受正念干预后,个体的内感受知觉(interoception)得以提升,有助于应对消极思维和情绪状态(Fissler et al., 2016),对压力的负性评价、应激状态下的血压水平和唾液皮质醇水平均有所降低,分泌型免疫球蛋白(Secretory IgA)有所增加(Creswell & Lindsay, 2014; Le & Proulx, 2015)。个体对压力和负性情绪识别明显提升且在干预后4个月效果依然保持(van der Gucht et al., 2019)。

同时,压力缓冲理论认为,正念训练缓和了个体对应激源的评估和压力性反应,从而能更轻松地适应环境(Creswell & Lindsay, 2014)。对压力评估的缓冲和调节作用需要个体能够放下和脱离对应激源或威胁来形成初级评价,由于正念训练注重对当下经历的身心状况进行评估的再觉知(representation)或去中心化(decentering)为个体提供了积极重评的可能,有效避免了个体由于压力或负性情绪事件而诱发冲动行为的表现(Garland et al., 2009)。研究发现,有经验的冥想者仍能够体验到负性情绪,但从生理和主观报告上均表现出更不容易受到压力和负性情绪的影响以至于反应激烈的特点(Rosenkranz et al., 2016),对疼痛的负性评价相较常人更低,这与其中扣带回皮质(midcingulate cortex)激活较低有关(Brown & Jones, 2010)。在4周正念训练后,大学生发作性酗酒行为(episodic drinking)减少亦伴随着个体压力觉知水平的下降(Cotter et al., 2021)。面对压力启动的吸烟线索刺激,经过10周正念干预的烟草成瘾者虽然初期表现出更大的心率变异率(Heart Rate Variation, HRV),但在恢复期能够很快的下降至稳定水平(Garland et al., 2010),提示对压力或负性体验的快速适应是通过增强个体对其刺激反应的包容和接纳得以实现。

2.3 正念训练弱化自动化特征的加工

尽管个体冲动行为形成之初更多受到奖赏效应推动的目标-导向行为的影响,但行为结果与诱发行为的相关线索若经过反复的条件作用形成紧密联结,会逐渐转化出刺激-反应(S-R)性质的自动化冲动反应行为。从情感冲动性的发展与长期维持来看,个体这种反射性、习惯化的信息加工倾向是适应不良冲动行为的重要潜在基础(Hanley & Garland, 2019; Kang et al., 2013),例如,成瘾者会对成瘾物质相关线索表现出更高的注意偏向反应(袁明等, 2017)。由于这一自动化加工过程无需太多意识参与、直接快速导向冲动行为,因而使得个体的自我控制无处施展。

研究发现,正念干预对于个体的自动化特征反应具有明显的减弱作用。经过10分钟正念录音干预后,相对控制组,正念组在种族和年龄的内隐联想测验(IAT)中具有自动化特征的内隐偏见效应下降(Lueke & Gibson, 2015)。在历时3周的正念干预后,参与者的条件反射行为(如眨眼)第1次启动时间延后且发生频率下降(Hanley & Garland, 2019)。在不一致的颜色信息和字义信息的Stroop任务中,8周正念训练减低了大学生由熟悉的字义信息引发的自动化反应;呈现性别刻板印象描述词的不匹配任务中,正念组参与者N400的波幅明显减小。这一结果说明正念干预对长时记忆中的特殊语义联结、自动化效应亦有减弱作用(顾瑛琦, 2018)。

对特定人群的研究显示,个体具有自动化特征的冲动性行为与其内在感受紧密相关。例如:饮食障碍患者、体重超重个体具有内在感受知觉下降特征(申可, 2016),物质成瘾者表现出内感受加工异常(May et al., 2022),分别对食物和成瘾物质相关线索反应增强。内感受被认为是正念训练使练习者受益的主要机制之一(Gibson, 2019)。全脑功能连接分析发现,经过正念干预,参与者右脑岛与其它脑区功能连接显著增强(Sharp et al., 2018),正念倾向提升越大者岛叶厚度增加更多,后脑岛静息态功能连接更强(Mooneyham et al., 2017)。研究发现,经过8周身体扫描训练的个体内在感受准确性有显著提升(Fischer et al., 2017),正念干预训练使体重超重个体对自然奖赏的内在感受能力得以提升,进而降低了其自动化注意偏向反应(Thomas et al., 2019)。与社交支持团体相比,

经过为期10周的团体正念干预后,酒精成瘾者在干预后表现出酒精相关线索的注意偏向效应明显下降(Garland et al., 2010),特别是对物质成瘾者的干预发现其对200 ms阈下成瘾物质相关线索刺激的注意偏向效应减弱(Garland et al., 2017)。可见,正念干预对于个体在意识水平或者注意的早期阶段所表现出来的自动化反应有所影响,为干预个体冲动的习惯化条件反应提供前提,而个体内在感受能力的提升对降低个体冲动性驱动力量起到了重要作用。

3 正念训练对冲动性控制因素的影响

相较于情感冲动性加工,认知控制加工发生于个体信息加工的相对后期,是一种自上而下、需要消耗一定认知资源的加工过程。在双加工模型中,个体动作或认知冲动性更多受这一过程的调节(Leshem, 2016)。不论青少年还是极端冲动的成年人情感系统功能如何,若认知控制系统功能不够强大,都可能会因为非情感性的执行控制加工缺陷而出现冲动行为。正念训练提升个体的觉察与专注水平,不仅减弱受反应抑制影响的动作冲动,而且降低与认知控制相关的等待冲动。因素分析结果发现,这两类冲动结果之间无明显的联系(MacKillop et al., 2016),冲动决策(等待冲动)更多地体现了思维参与的控制过程,而动作冲动表现更多体现在行为抑制方面。

3.1 正念训练提升个体的抑制控制能力,降低动作冲动

抑制控制也称作反应抑制,是指个体限制不合时宜或无益外显行为冲动的能力,对于抑制或者调整行为以达成个人目标至关重要(Garland et al., 2019),它是注意缺陷与多动障碍和行为障碍的重要结构之一,同时是成年精神病性和反社会型人格障碍的主要特征,低抑制控制个体表现出较高的动作冲动性(Logan et al., 1997; MacKillop et al., 2016)。

除了特质性正念与抑制控制有显著的关联性(Oberle et al., 2011),短期正念训练亦能够提升个体对自身感觉、情绪和想法的觉察能力,进而增强个体自上而下的控制系统功能和情绪调节(Chiesa et al., 2013; Ron-Grajales et al., 2021)。大脑结构和神经回路的研究发现,正念训练使额下回灰质增厚,增强了前扣带回、内侧前额叶皮层和额下回之间的连接(Tang et al., 2015)。进行情感

图片加工任务时, 经过短期正念干预者的杏仁核反应减弱, 但杏仁核和腹内侧额叶皮层之间会产生更强的功能连接(Kral et al., 2018)。同时, 正念训练对个体的执行注意提升有积极助推作用(Tang et al., 2015), 从而提升个体的执行功能, 降低个体的动作冲动。

一项对接受阿片类药物的慢性疼痛患者($N = 27$)为期8周的正念干预研究中, 正念组比对照组(积极支持组)在对疼痛相关的视觉分心物反应表现出更明显的错误率下降, 提示干预后个体对于负性情绪性干扰的抑制控制能力有所提升(Garland et al., 2019)。其中, 练习时长和非反应性(nonreactivity)的提升显著预示着更强的情绪反应抑制能力。类似地, 经过10周正念干预的青少年犯在停止信号任务和Stroop任务中均表现出抑制控制能力的进步(Ron-Grajales et al., 2021)。为期3周正念呼吸训练的ERP研究中, 与等待对照组相比, 正念干预组个体在Go/No-Go任务中对No-Go试次表现出更强的N2信号以及做出错误反应时更大的错误相关负波(ERN)(Pozuelos et al., 2019), 提示干预后个体具有更强的自我监控与元认知加工能力。

此外, 基于正念的干预对于个体抑制控制能力提升还体现在其它方面。例如, 边缘型人格障碍患者在时间知觉(time perception)任务上表现出对给定时间长度进行现实时间估计短于正常人的冲动性特点(Berlin & Rolls, 2004)。经过数周正念干预, 这种高估时间长度的内在认知节奏(cognitive tempo)能受到调整, 对固定时间的知觉时长变长, 表现出更有耐心, 抑制冲动能力有所提升(Soler et al., 2016)。

3.2 正念训练降低个体的冲动决策, 弥补认知控制不足

冲动决策的测量可以分为用延迟折扣任务测量的跨期决策(Intertemporal choice)和以冒险任务测量的风险决策(Liu et al., 2018; Reynolds et al., 2006)。跨期决策是指人们对不同时点的损益做出决策的过程, 通常是在较小的即时奖赏与较大的延迟奖赏之间进行选择(Keidel et al., 2021), 个体的选择倾向可以通过 k 值(延迟折扣率)来表示*。 k

值越大, 个体更倾向选择即时奖赏。在正念练习中, 由于个体会被引导觉察环境中的各类变量, 对这些变量的觉知将有助于个体做出长期有利的决定。研究发现, 对大学生进行5分钟以身体扫描、肌肉放松和正念意识培养为主的简易正念视频干预后, 个体跨期决策冲动性有所下降, 但控制组未见此变化(Dixon et al., 2019)。而具有肥胖特征个体大多对食物表现出较明显冲动进食特点, 这种冲动性亦体现在食物和金钱的延迟折扣任务中更倾向选择即时回报(Hendrickson & Rasmussen, 2017)。在另一项对大学生($N = 102$)的正念进食干预训练的对照研究发现, 干预后正念组个体在食物有关的延迟任务中的 k 值显著下降, 但在金钱相关的延迟折扣任务中的反应不存在明显变化, 控制组则在两类任务上均无明显前后测变化(Hendrickson & Rasmussen, 2013)。此外, 对网络游戏成瘾者(Internet Gaming Disorder, IGD)进行现实疗法与正念训练结合的6周治疗后, 相对于控制组, 在干预前后 k 值表现出显著的下降, 甚至达到与健康控制组近似水平(Yao et al., 2017), 提示其跨期决策冲动性的下降。对边缘型人格障碍患者的10周正念干预亦得到类似结果(Soler et al., 2016)。

然而, 在与风险任务的相关决策表现上, 正念干预的介入似乎并未形成比较统一的结论。决策冲动性可通过经典的研究范式包括气球模拟风险任务(Balloon Analogue Risk Task, BART)、爱荷华赌博任务(IOWA Gambling Test, IGT), 以及其它决策任务中的风险偏好来体现。通常, 个体风险偏好越高, 认知控制水平越低, 冲动性越强。对IGD患者进行6周的正念联合干预研究显示, 干预前后并无明显的BART风险决策差异(击破气球数和平均拍打次数)(Yao et al., 2017)。而另一项对40名成年个体的网络正念干预随机对照研究发现, 一次10分钟的正念音频干预后, 个体在金钱任务中倾向做出更规避风险的选择, 即选择获得确定性高但数额较小的收益(Zhang et al., 2021)。这一主题研究结果的差异, 可能是由于不同研究中使用的任务差异, 可能也受到个体的感觉寻求等相对稳定的特质因素影响。

4 正念训练对冲动性整体的影响

尽管依照双加工理论模型, 冲动性被划分为

* $V = A/(1+kD)$, V 是个体对于奖赏 A (大小) 在延迟 D 天时获得的主观价值。

情感冲动性和认知/动作冲动性,从整体上看,个体的冲动性是个体情感欲求与自我控制两类心理活动对抗的过程特征和结果。个体高冲动性的深层原因可以分为至少两类情况:一是个体对自身内在感受(例如,饥饿、渴、物质剥夺等)缺乏足够的觉察与意识,因而即便个体具备足够的自我控制能力也无计可施。二是个体的冲动欲求过于强烈,大大超越当下已有认知/动作控制的能力,导致抑制失灵。正念训练对个体冲动性的整体影响主要通过对冲动性加工过程中的不同心理结构分别进行作用,促进驱动因素的动力削弱和控制因素的有效实施和干预,二者交互影响共同降低个体的整体冲动性。

4.1 正念训练作用于冲动性不同要素的加工时序,提供有效干预时机

个体冲动性不同要素间的相对先后加工的时间差和强度对抗关系成为正念训练能够影响冲动性的重要前提。如 Stephen Covey 所引述:在刺激和反应之间存在一个空间,正是在这个空间里,我们有自由和力量去选择我们如何回应(Pattakos & Dundon, 2010)。面对诱发个体冲动的刺激,正念训练的干预效果正是通过扩大这一“空间”来实现。具体表现在:一方面,正念训练帮助个体提

升对自身体验和自我意识的觉察,例如,对当下自身与环境的觉知帮助个体不断更新对诱发刺激价值的评估,减弱奖赏效应的预期和强度,缓冲压力或负性情绪带来的影响,使个体超越自动化反应(Brewer, 2019)。另一方面,随着习惯化反应倾向减弱,正念训练为调动认知控制参与到对冲动的控制进程中提供了时间窗,而对自身感受的清晰觉知为个体做出有技巧的反应提供了行动方向。正念训练力求对当下体验的觉察,培养反应灵活性和情感宽容度,近似形成一种对情感冲动性的“暂停”,减少对以往经验的滞留和对未来不切实际的预期,有利于做出更为“理性的反应”。如图1所示。

4.2 正念训练提升注意和正向态度,对冲动性驱动性因素和控制性因素交互影响

注意(attention)和态度(attitude)是正念作用机制的两大核心元素,研究者普遍认同个体注意对象的转换是实现思维从“行动模式”向“存在模式”的转变关键(彭彦琴,居敏珠,2013)。目前,对于何种原因使正念训练降低个体的自动化反应联结存在不同的观点。有学者认为这种减弱是受到意志控制(volitional control)的影响(Hanley & Garland, 2019),也有学者认为正念干预所带来的

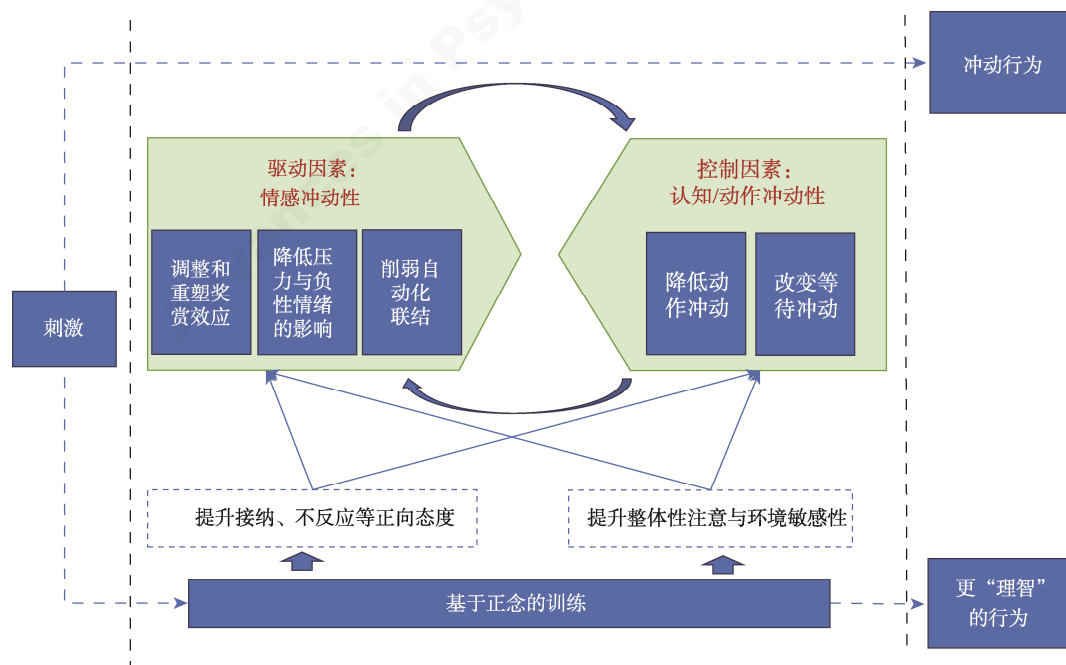


图1 正念训练对双加工系统下不同冲动性要素作用示意图

去自动化反应(de-automation)并不在于个体自上而下加工过程参与的增加,而是个体整体性注意和觉知环境敏感性的提升,从而表现出更高的认知灵活性(Shankland et al., 2021)。肌纤维疼痛患者的疼痛相关线索研究发现,正念训练不仅降低了注意早期(100 ms)自动化特征的注意朝向反应,也促进了注意后期认知控制加工参与的注意维持/注意解脱(Vago & Nakamura, 2011)。不难发现,正念训练对个体冲动性驱动因素的影响可能还需要通过改变控制因素来实现。

更重要的是,高冲动性个体在社会生活中具有易受情绪驱动和缺乏耐心,或对自身体验无法完全接纳等特征(Morrison et al., 2019; Whiteside & Lynam, 2001)。研究发现,正念练习中对描述、不反应和接纳等正向态度的提升能降低或调节个体情绪反应,减弱对冲动性驱动性因素对个体控制能力的干扰,进而实现更好的自我调节(Garland et al., 2019; Hamill et al., 2015; Iani et al., 2018)。当然,这种态度的提升通常需要相对长时的练习和足够的耐心来达成,在没有熟练掌握的情况下,可能存在还不如个体原有调节方式的情况。

因此,不论正念训练是通过注意还是态度对个体的冲动性施加影响,对冲动性两类要素的影响是交互发生,互相作用的。从双加工理论看,正念训练对个体冲动性影响的实现,并非独立作用于冲动性某个单一结构,而是通过对冲动性的驱动性因素和控制性因素共同作用,二者进行交互影响,从而实现从整体上降低个体的冲动性。

4.3 未来研究展望

随着正念训练对冲动性作用机制研究的深入,已有少量研究将两类冲动性要素纳入正念干预效果的讨论中(Garland et al., 2019; Hamill et al., 2015)。未来仍需要更多的研究为正念训练对冲动性两类要素之间的作用关系提供实证支撑,特别是将驱动个体冲动性的因素纳入系统框架,为冲动性的病理性理解和实践工作提供重要思路。以后的研究和临床干预还可以从研究设计、测量内容及干预方式等方面进行延伸。具体而言,包括以下两方面:

动态跟踪正念干预对不同冲动性要素的干预效果。干预的时长和频率是影响干预效果的重要因素,目前系统化正念干预一般都持续4-8周,集中聚会形式的形式持续数天至数周不等。尽管在

持续时长较短的正念干预中已可以观察到对冲动性的干预趋势,但追求个体冲动性干预的长期稳定效果是理想的临床目标。有学者提出,正念训练对练习周期较短者的情绪调节影响更多是依赖自上而下的加工,但对于练习时间较长者,这种加工过程就会逐渐内化为具有自动化特征的过程(Chiesa et al., 2013)。因而,正念训练对个体冲动性不同要素的发展与转变时机的影响需要动态的追踪和评估,特别是对奖赏效应、压力和负性情绪以及自动化反应等驱动因素的测察,是双加工理论框架下期待能够更准确回答的问题。

线上自助式正念干预与虚拟技术(Virtual Reality, VR)对个体冲动性要素的影响研究。以互联网为媒介,进行线上自助式干预是当下临床干预的新趋势,其低成本、便利的资源获得、跨地域局限等特征,借助手机或电子产品终端使线上正念干预有更为广阔的应用场景。现有线上干预研究尚处在探索阶段,主要以个体冲动性外在特征为测量指标,缺少从双加工过程视角对冲动性内在机制的探索与讨论(Johnson et al., 2020; Mason et al., 2018; Pheh et al., 2021)。值得关注的是,由于冲动性个体通常具有易受情绪因素干扰或相对较弱的自我控制特征,对于维持线上干预存在一定挑战。另一方面,结合使用VR技术具高生态性和互动性,能增加参与者“暴露”体验下的觉察,提升元认知意识。然而,正念干预是一项需要重复和个体主动性的训练,这对VR材料适配性提出了新的要求,同时,技术的使用对个体干预的主观能动性亦可能存在一定程度的剥夺。以上这些,都有待更加细致和深入的研究。

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The effects of mindfulness-based interventions on different components of impulsivity: From the perspective of dual-process theories

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Abstract: *Mindfulness* can be defined as the intentional awareness of individual's physical and mental experiences with a non-judgmental attitude. From the perspective of dual-process theories, Mindfulness-based interventions (MBIs) show observable effects on the different components of impulsivity. On the one hand, MBIs help to diminish the driving forces caused by the socioemotional system: by reducing individual reward evaluation and expectation, alleviating the distress and negative emotion, and weakening the connection and intensity of automatic responses. On the other hand, MBIs enhance the controlling force of impulsivity and mitigate the action/cognitive impulsivity regulated by the cognitive control system: by enhancing individual's capabilities of cognitive control and inhibitory control, and diminishing waiting impulsivity. Due to different processing sequence and intensity of the two components of impulsivity, MBIs facilitate the positive interactions between the two components, minimize the imbalance between *the driving forces* and *the controlling force*, providing a favorable buffer for individuals to better respond to their own and external stimuli. In sum, MBIs are effective intervention means to reduce individual's impulsivity.

Keywords: mindfulness-based interventions, impulsivity, dual-process theory, driving forces, controlling forces