

阅读障碍的教育评估与干预

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摘要: 阅读障碍是特殊学习困难中最常见的类型, 影响约 5%~10% 的学龄儿童。本文从认知心理学视角出发, 系统梳理了阅读障碍的认知机制、评估工具、诊断标准与干预研究, 指出阅读障碍的测评和干预重点是解码能力(字词识别), 未来应结合人工智能与教育技术的发展, 推动早期筛查和循证干预体系的建设。

关键词: 阅读障碍; 评估; 干预; 汉语; 认知机制

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Educational assessment and intervention of dyslexia

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Abstract: Dyslexia is the most common type of specific learning difficulty, affecting approximately 5% to 10% of school-age children. From the perspective of cognitive psychology, this paper systematically reviews the cognitive mechanisms, assessment tools, diagnostic criteria, and intervention research on dyslexia, and highlights that the primary focus of its assessment and intervention is decoding ability (character recognition). Future efforts should integrate advances in artificial intelligence and educational technology to promote the establishment of early screening and evidence-based intervention systems.

Keywords: dyslexia; assessment; intervention; Chinese; cognitive mechanism

阅读能力是“学习的基础, 教育的灵魂”, 能够阅读是现代社会对每一个儿童的基本要求。然而, 尽管阅读教育受到全社会的高度关注, 全球范围内仍有部分智力正常的学龄儿童难以学会阅读, 成为发展性阅读障碍儿童^[1]。阅读落后不仅影响儿童的学业成绩, 还常伴随挫败感、焦虑等负性情绪, 对儿童的自我概念、心理健康等造成不良影响, 并限制其未来职业选择与终身发展。

根据《精神障碍诊断与统计手册(第 5 版)》(Diagnostic and Statistical Manual of Mental Disorders-fifth edition, DSM-5)^[2], 阅读障碍是特殊学习障碍的一种, 指在智力正常且受教育机会正常的条件下, 个体在识字、阅读理解等方面持续表现出显著困难, 影响其学业和社会适应, 其发生率为 5%~10%, 并与注意缺陷多动障碍^[3]、数学学习障碍^[4]、书写障碍^[5]等存在较高共患率。约 80% 的学习困难儿童实际上属于阅读障碍^[6]。阅读障碍具有明显的家族遗传倾向, 且男童患病率显著高于女童^[7]。在基础教育阶段, 症状表现最为典型。成年后, 阅读障碍患

者尽管单词识别正确率较高, 但难以达到自动化水平, 阅读效率持续落后^[8]。在中文情境下, 阅读障碍的发生率约为 2.3%~8.4%^[9]。“学习困难门诊火爆”、“育儿焦虑加剧”等社会现象, 折射出公众对阅读障碍精准识别与有效干预的迫切需求。然而, 汉语阅读障碍研究起步较晚, 且由于汉语和拼音文字的巨大差异, 难以直接借鉴西方的研究成果。基于此, 本文从认知心理学视角系统梳理中英文背景下阅读障碍的认知机制、评估工具与干预现状, 并提出未来研究方向与建议。

1 阅读障碍的认知机制

1.1 阅读理解过程与阅读障碍 阅读是一种后天习得的复杂技能, 需要多种分技能协同运作, 其最终目标是获取书面文本的含义。根据简单阅读观(The Simple View of Reading, SVR)理论^[10-11], 阅读理解由言语理解(linguistic comprehension)与解码(decoding)两个相对独立的认知加工过程构成。

言语理解(又称听力理解)是指理解口头语言的

认知加工过程。解码能力指识别书面文字符号并将其转化为口语形式的过程。在拼音文字中,解码通常指根据形-音转换规则(grapheme-phoneme correspondence, GPC)快速准确地拼读单词的能力;在汉语中通常指字词识别。简单阅读观以“阅读理解=解码能力×言语理解能力”公式表明,解码与言语理解缺一不可^[12]。小学低段,识字量对阅读理解影响更大;随着年级升高,言语理解的预测作用逐渐超过识字量,成为主要影响因素^[13-14]。Hoover 等^[15]指出根据简单阅读观中两种能力的高低,可以将读者划分为 4 种类型。见图 1。

字词识别	良好	读词者 (Hyperlexia)	正常儿童 (Good readers)
	落后	全面落后 (Mixed Disability)	阅读障碍 (Dyslexia)
		落后	良好
		言语理解能力	

图 1 根据简单阅读观划分的 4 种读者类型

Fig. 1 Four types of readers according to The Simple View of Reading

阅读障碍型学生的言语理解能力正常,但文字识别能力落后,其阅读能力落后的根源是解码过程(字词识别),而非高级理解过程,相应的评估与干预也应侧重字词识别。

1.2 阅读障碍研究的理论框架 自首例阅读障碍病例被报道以来,研究者一直致力于探寻发展性阅读障碍的成因,心理学领域的探讨主要集中在语言学^[16]和非语言学^[17]两个层面。

在语言学层面,语言加工模块化理论的支持者认为,发展性阅读障碍儿童的语言模块受损,特定语言信息的表征与加工缺陷是造成阅读落后的核心原因。其中,最具影响力的“语音核心缺陷假说”(Phonological Deficit Hypothesis)^[18]和“双重缺陷假说”(Double-Deficit Hypothesis)^[19]认为阅读障碍儿童的语音表征、提取或操作方面存在特殊缺陷,难以掌握字形-语音对应规则,进而阻碍了书面词解码与阅读能力的发展。语音意识(phonological awareness)和自动化命名技能(rapid automatized naming, RAN)缺陷是识别和预测阅读障碍的关键指标,并且在英语等不透明语言中,语音意识更重要,而德语等透明语言中,二者同等重要,体现了正字法深度对阅读习得的影响。

在非语言学层面,认为阅读习得困难可能源于听觉、视觉、时间加工或技能自动化等基本能力缺

陷。例如,“巨细胞缺陷假说”(Magnocellular Deficit Hypothesis)^[20]认为,巨细胞系统功能障碍会削弱对快速变化的视觉或听觉刺激的时间分辨能力,从而影响语音处理和字母识别。“自动化缺陷理论”(Dyslexia Automatization Deficit)^[21]则认为,小脑功能失调会阻碍技能自动化的形成,使患儿无法像正常儿童那样对视觉词汇进行快速、准确的自动解码。

汉字作为仍在使用的最古老的文字系统,与拼音文字差异显著。早期曾有人认为中文不存在阅读障碍^[22],但 Stevenson 等^[23]的研究却发现,汉语阅读障碍的发生率与英语接近。大量后续研究表明,一方面,汉语阅读障碍儿童同样存在语音意识缺陷^[24]、命名速度缺陷^[25]、视空注意缺陷^[26]和形音整合缺陷^[27]等,呈现跨语言一致性;另一方面,汉字结构复杂且具表意性,同音字、多义字现象普遍,使得汉语阅读障碍儿童表现出特有的语素意识缺陷^[28]和正字法缺陷^[29]等,具有汉语的特殊性。

2 阅读障碍的评估

2.1 评估工具 西方对阅读障碍的研究已有百余年历史,相应评估工具与体系相对完善。诊断发展性阅读障碍时,通常涵盖两个核心领域:1)单词读写能力——包括单词阅读准确性、流畅性及拼写能力,常用工具有词汇阅读效率测验^[30]、韦氏个人成就测验^[31]、广泛成就测验^[32]及伍德考克-约翰逊成就测验^[33]的阅读分测验等;2)阅读相关认知能力——主要聚焦语音加工技能,常用工具有语音加工综合测验^[34],评估语音意识、语音记忆和快速命名等技能。这些工具覆盖从幼儿到老年的全年龄段,具备年龄或年级常模,提供标准分、百分位等级及阅读障碍专项指数,对评估儿童的学业落后程度、识别风险、确定亚型及制定干预方案均具有重要价值,在学校心理学、临床心理学及教育研究中应用广泛。

评估汉语阅读障碍的诊断工具相对匮乏,其中中国香港地区针对繁体字粤语儿童的工具较为全面。何淑娴等^[35-36]研发的“香港学生读写障碍系列评估工具”覆盖多个学段,建立了当地常模,并构建了“早期筛查-专业评估-分层干预”流程^[37]。早期筛查阶段采用易操作的行为量表快速筛查高风险儿童;专业评估阶段使用《香港小学生读写障碍测验》全面测查字词读写与相关认知能力(语音意识、语音记忆、快速命名、正字法意识及语素意识)。在中国大陆,医院临床多依据 DSM-5 特定学习障碍的结构化临床访谈识别阅读障碍,但该方法并非专门针对

阅读障碍。心理学研究中的评估工具可分为行为量表与标准化测验两类。行为量表类有吴汉荣等^[38]编制的针对 2~6 年级学生的儿童汉语阅读障碍量表;范奕敏等^[39]编制的小学生阅读障碍行为筛查家长问卷,完整版 30 题,后经机器学习优化形成仅 6 题的简化版^[40],可有效区分 1~6 年级风险儿童与正常儿童。但此类问卷仅适用于风险预警,不能作为诊断标准^[41],异常者需进一步接受标准化测评^[42]。

标准化测验方面,汉字识别测评工具有王孝玲等^[43]的小学生识字量测试、温红博等^[44]的义务教育阶段学生识字量测验及 Li 等^[45]的中文识字量测验,孟祥芝等^[46]的汉语发展性阅读障碍评估测验(the Chinese Developmental Dyslexia Assessment Test, C-DDAT),能有效测量字词识别准确性或流畅性,信效度良好,但多未包括阅读相关认知技能。

近年来,综合性汉语阅读障碍诊断测验开始涌现。Huang 等^[47]的汉语阅读能力测验除测量识字量外,还评估语音意识、语素意识、正字法意识及快速命名等关键认知技能,适用于 3~5 年级小学生;Liu 等^[48]的普通话发展性阅读障碍量表包含 10 个分测验(汉字阅读正确性、词汇朗读流畅性、汉字听写、词汇量、语音工作记忆、语素意识、语音意识、视觉空间注意、快速命名、正字法意识),适用于 1~3 年级学生;王久菊等^[49]将北京师范大学舒华课题组纸质版诊断测验电子化,涵盖阅读准确性、流畅性及语音意识、语素意识、正字法、快速命名 4 种核心认知技能,并基于全国分层抽样建立了 1~6 年级小学生的常模,实现了测验流程标准化与自动化分析,显著提高了测评效率与准确性。

2.2 诊断标准与流程 目前,阅读障碍的诊断普遍遵循“不一致原则”(Discrepancy Principle),即在智力正常的前提下,比较个体期望的阅读能力与实际阅读能力之间的差距,并要求其至少存在一项阅读相关的认知能力缺陷,方可确诊。

以美国加州为例,诊断标准包括:1)标准化学业测评分数显著低于智力水平(差距 ≥ 1.5 个 s);2)在语音分析与加工、短时记忆、视动统合等信息处理能力中至少一项表现显著低下(百分等级 ≤ 10)。这些测评由专业的学校心理学家(School Psychologist)实施,辅以家长访谈、课堂观察及一对一面谈等环节。

在中国大陆,阅读障碍的诊断主要集中在学术研究领域,常用标准为智力正常,字词阅读的正确性或流畅性低于同龄平均值 1~1.5 个 s ,并伴随至少

一项认知能力缺陷。目前仅有少数医院引入了标准化工具以提高诊断的客观性。

3 阅读障碍的干预

当前,我国大陆地区尚缺乏基于充分证据、可广泛推广的系统干预模式,相关研究多集中在学术领域。干预研究大体可分为语言特异性与非语言特异性两类。

语言特异性干预针对语言学层面的核心缺陷,直接利用语言文字材料进行训练,内容包括语音、语素、正字法及阅读流畅性。例如,Shen 等^[50]开发了语音加工与语素加工训练任务,发现 4 周的线上干预能显著提升 5 年级阅读障碍学生的阅读能力;Feng 等^[51]发现,语音训练促进补偿性语音策略形成,语素训练则有助于左侧核心阅读网络正常化。Dai 等^[52]比较了不同加速阅读模式,发现汉字加速与词语加速阅读均能提升速度与理解,且词语加速在保持理解水平方面更优。Li 等^[53]利用 Grapho Game 拼音游戏对 1 年级拼音薄弱学生进行干预,显著提高拼音朗读、音位意识与汉字阅读能力,并且对注意缺陷多动障碍合并阅读障碍儿童亦有效^[54]。Ruan 等^[55]元分析显示,在多种干预形式中,形-音-义整合的阅读流畅性训练效果最佳,语音、语素及正字法训练也有一定的积极作用。

非语言特异性干预基于阅读障碍存在更底层视听知觉障碍的假设,针对这些能力进行训练。例如,Zhang 等^[56]发现两周纯音时长辨别训练可提升时间间隔辨别,并迁移至语音意识、汉字识别及阅读流畅性,且效应在两个月后保持稳定。戴琳等^[57]基于视觉大细胞-背侧通路理论开发了游戏化训练,发现 7 周干预仅具备一定快速命名与语音意识基础的学生有效。元分析表明,对提高学生的字词识别而言,解码技能干预(兼顾准确性与流畅性)效果最优;在阅读理解方面,元语言学训练效果最佳,其次为解码技能干预,认知技能干预效果不明显^[58]。

4 未来趋势

阅读障碍是全球性教育挑战,对儿童学业成就与未来发展均有深远影响。我国儿童青少年人数超过 2 亿,若按 5%患病率估算,阅读障碍儿童超过千万。未来的阅读障碍干预还需要在“早识别、早干预”和“个性化、科技化”两方面同时发力。一方面,若能通过大面积筛查实现早期识别高危儿童,并在儿童出现明显困难前实施干预,可由“治病”转向“防病”,起到事半功倍的效果;另一方面,人工智能、大

语言模型与教育技术的快速发展为个性化干预带来新机遇。未来将自适应算法、人机交互与本土化教育内容结合,有望在提高干预效率的同时,降低资源消耗,实现预防与矫治的双重目标。

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