

# 儿童负性情绪注意偏向研究进展

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**摘要:** 儿童心理健康问题是当前我国儿童保健领域面临的巨大挑战, 而负性情绪注意偏向是其极为重要的早期风险因素。负性情绪注意偏向在婴儿中即被观察到, 且贯穿儿童全周期不断发展变化, 受内外多因素影响。本文重点论述负性情绪注意偏向在儿童期的发展规律及关键影响因素, 为儿童心理健康问题的早期预防和干预提供参考。

**关键词:** 负性情绪; 注意偏向; 情绪调节; 儿童

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## Negative emotional attention bias in children

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**Abstract:** Mental health problems in children constitute great challenge for children's primary care in China. Negative emotional attention bias is considered as an important early risk factor. Negative emotional attention bias has been observed in infants with development throughout the childhood, influenced by several internal and external factors. This article focuses on the developmental patterns of negative emotion attention bias during childhood and its key influencing factors, providing references for early prevention and intervention of child mental health problems.

**Keywords:** negative emotion; attention bias; emotion regulation; children

近年来心理健康问题受到了普遍关注, 其造成的全球疾病负担稳居高位<sup>[1]</sup>, 也已成为 5~14 岁儿童青少年疾病负担最重的疾病组群<sup>[2]</sup>。在我国, 17.5% 的 6~16 岁在校学生存在精神障碍<sup>[3]</sup>, 18.7%~27.8% 的学龄前儿童存在情绪行为问题<sup>[4]</sup>。此外, 心理健康问题的低龄化趋势愈加明显, 在婴幼儿期即可表现出持续的心理行为症状, 而 2~3 岁幼儿社会情绪和行为问题的发生率约为 7%~24%<sup>[5]</sup>。生命早期是情绪调节发展的关键期, 深入了解其关键要素及影响因素对于制定儿童心理问题的早期预防和干预策略具有重要意义。

### 1 负性情绪注意偏向在儿童情绪调节中的作用

情绪调节是影响心理健康问题发生发展的关键心理过程。儿童的情绪调节能力随着年龄增长不断完善, 在婴幼儿期主要涉及注意分配调整, 并且在照料人的干预下进行情境选择或修改<sup>[6]</sup>。其中, 情绪注意偏向(emotional attention bias)是情绪调节的关键环节。注意偏向(attention bias, AB)是指由于视觉加工系统的有限性, 个体在信息加工的编码阶段会在大量信息中找出某些特殊类别的信息进行优先加工, 表现出对特殊类别刺激较高的敏感度和选择性注意的过程。情绪注意偏向是指与无情绪信息

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的刺激相比,个体能更迅速或持久地注意包含情绪信息的刺激并进行加工<sup>[7]</sup>,被认为是其他情绪调节过程如情境选择、认知重评等的基础<sup>[8]</sup>。目前,情绪注意偏向的评估依赖于心理学范式,包括点探测范式(dot-probe paradigm)、情绪 Stroop 范式(emotional stroop paradigm)、空间线索范式(spatial cuing task)、视觉搜索范式(visual search task)、间隔重叠任务范式(gap/overlap task)等。

负性情绪注意偏向(negative emotional attention bias)是指个体相对于中性和积极情绪刺激,对威胁性或负性刺激表现出更多注意的特定分配模式<sup>[9]</sup>。研究显示,负性情绪注意偏向与抑郁、焦虑等问题密切相关<sup>[10-11]</sup>,是儿童青少年心理健康的高危因素。一项 Meta 分析发现,与非焦虑组相比,焦虑组儿童明显表现出回避威胁刺激的注意偏向,反映了适应不良的情绪调节策略<sup>[12]</sup>。在更年幼的婴幼儿中,如 7~8 月龄的婴儿对恐惧面孔的注意偏向可预测积极的社会发展,包括亲社会行为<sup>[13]</sup>和较好的社会情绪能力<sup>[14]</sup>等。负性情绪注意偏向还存在代际传递的特点,例如情绪障碍母亲对威胁的注意偏向越明显时,儿童的焦虑症状也更严重<sup>[15]</sup>;当母亲表现出回避积极刺激的注意偏向时,儿童也会出现消极的注意偏向,而这可能是儿童情绪障碍的风险标志<sup>[16]</sup>。此外,干预性研究发现注意偏向矫正(attention bias modification, ABM)可通过减少个体对威胁性信息的注意偏向缓解儿童青少年的抑郁和焦虑症状<sup>[17-18]</sup>。综上,负性情绪注意偏向在儿童情绪调节中扮演重要角色,有望通过矫正改善其情绪问题。

## 2 负性情绪注意偏向儿童期发展特点

负性情绪注意偏向有助于个体发现环境中潜在的威胁或危险,对儿童的生存和发展具有重要意义,但这一特质是否与生俱来,其发展特点又是如何,尚未得到深入研究。

2.1 婴儿期 目前新生儿情绪注意偏向的研究还非常有限。仅有几项小样本研究表明,与中性面孔相比,新生儿对恐惧和快乐面孔并不敏感,而在恐惧面孔和快乐面孔同时呈现时,表现出对快乐面孔更强的注意偏向<sup>[19]</sup>。这种对正性情绪的注意偏向可能是由于新生儿出生后看到的大多是微笑或快乐的面孔,很少接触到恐惧或中性面孔<sup>[19]</sup>。情绪注意偏向在婴儿期会快速发展<sup>[20]</sup>。例如,3 月龄婴儿观看一系列强度逐渐增加的微笑面孔时,更喜欢高强度的微笑面孔<sup>[21]</sup>。当快乐面孔和恐惧面孔同时呈现时,3 月龄婴儿对恐惧面孔的注视时间比快乐面孔

更长,提示可能已经形成了负性情绪注意偏向<sup>[22]</sup>。但上述研究中使用恐惧与快乐面孔同时出现的视觉配对比较任务,其结果可能同时受到情绪效价和强度两方面的影响,反映的是强度偏向而非负性情绪偏向<sup>[23]</sup>。由此可推测,新生儿可能存在对快乐面孔的注意偏向,而这种注意偏向在 3 月龄时可能消失。

5~7 月龄婴儿通常能对面孔表达的情绪表现出一定敏感性并可进行分类<sup>[24]</sup>。行为学研究结果显示,3 月龄以上婴儿表现出与成人类似的恐惧面孔注意偏向<sup>[25]</sup>,这是婴儿情绪感知发展的显著特征之一。但是,也有研究未在 5 月龄婴儿中发现其对快乐或恐惧面孔的注意偏好<sup>[26]</sup>。而 7 月龄婴儿表现出更喜欢看恐惧面孔<sup>[27]</sup>,且事件相关电位(event-related potential, ERP)研究显示负中枢(negative central, Nc)及枕颞区与面孔相关的 P400 成分的振幅更大<sup>[28-29]</sup>。在 7~12 月龄婴儿中进行的研究也表明,婴儿对恐惧面孔表现出特定的注意偏向,而非快乐和中性面孔<sup>[27,30]</sup>。在负性情绪中,对于恐惧和愤怒两种负性情绪的研究结果并不一致。一项研究发现 8~14 月龄的幼儿表现出对愤怒面孔的注意偏向<sup>[31]</sup>,然而另一项在 12~18 月龄幼儿中进行的研究观察到的则是对恐惧面孔的注意偏向<sup>[32]</sup>。此外,ERP 研究发现,7 月龄婴儿在注视愤怒和恐惧面孔时的脑电反应有所不同<sup>[33]</sup>。因此,5~7 月龄可能是婴儿情绪注意偏向迅速形成并发展的关键期,在此之后儿童逐步形成稳定的负性情绪注意偏向。

2.2 幼儿及学龄前期 从幼儿期开始负性情绪注意偏向趋于稳定。既往研究发现,60 月龄儿童表现出对恐惧面孔的注意偏向,但强度随年龄增长而减弱<sup>[34]</sup>。Morales 等<sup>[35]</sup>提出的混合级联模型强调了成熟与经验对注意偏向的影响,认为早期注意偏向主要依赖于警觉系统和定向系统<sup>[36]</sup>,而到 3~4 岁时执行注意系统开始发展,对定向反应加以控制,使个体能够在竞争反应中进行选择<sup>[37]</sup>。有研究显示,小年龄儿童由于缺乏抑制对威胁刺激处理的能力,会表现出对威胁刺激的注意偏向。随着抑制控制等能力不断发展,儿童能够主动调节对威胁刺激的优先注意<sup>[38]</sup>。但如果个体未发展出适当的抑制控制能力,则可能无法有效抑制对负性刺激的注意偏向,情绪易感性增加,容易出现情绪问题<sup>[39-40]</sup>。学龄前期是抑制控制能力发展的早期阶段,此时负性情绪注意偏向强度会逐渐减弱,但依然存在。

2.3 儿童青少年期 在儿童青少年中,已有研究主要探索负性情绪注意偏向与精神心理疾病尤其是焦虑症的关系。儿童、青少年对威胁面孔的注意偏向

通常会逐渐减弱<sup>[41-42]</sup>,而在焦虑症儿童中并未观察到这一现象<sup>[43]</sup>。已有成人研究发现,基于计算机的注意偏向矫正训练可通过改变注意过程有效减轻焦虑<sup>[44]</sup>。近年来,注意偏向矫正训练应用于改善儿童青少年焦虑的支持性证据也不断增加<sup>[17]</sup>。由此可见,儿童青少年期的负性情绪注意偏向持续存在且趋于稳定,而过于强烈可能是引发该群体精神心理疾病的风险因素之一。

综上所述,负性情绪注意偏向可能在出生后第一年的下半年开始出现,在发育过程中其强度逐渐下降且稳定存在,而这一发展模式可能在维持良好情绪调节能力中发挥重要作用。因此,进一步明晰早期有益的情绪注意偏向模式,识别甚至干预过度的负性情绪注意偏向将为提高儿童青少年心理健康提供线索及理论支持。

### 3 负性情绪注意偏向发展的影响因素

负性情绪注意偏向对儿童社会情绪发展及相关心理健康问题有重要的影响,且其在儿童中呈现出随年龄变化以及强弱不等的特点。明晰影响儿童负性情绪注意偏向的关键因素,可为阐明负性情绪注意偏向影响儿童精神心理疾病潜在机制,制定早期针对性的个体化干预策略提供理论支持。

#### 3.1 个体因素

3.1.1 性别 使用点探测范式对 9~12 岁儿童进行研究,仅在女童中发现了对恐惧图片更强的注意偏向<sup>[45]</sup>;在成年人中也发现了类似现象<sup>[46]</sup>。因此,目前认为性别是影响负性情绪注意偏向的关键因素,而女性受情绪信息影响更多,对情绪的体验更深刻<sup>[47]</sup>,也因此更容易对负性情绪刺激产生注意偏向。

3.1.2 气质 使用点探测范式的眼动研究发现,注视愤怒面孔的时间与注视探针的潜伏期呈负相关,且受到婴儿气质的调节。负性情绪较低的婴儿更易对愤怒面孔产生注意偏向<sup>[48]</sup>。行为抑制(behavioral inhibition, BI)特征是对新奇事物的恐惧和回避。研究表明,幼儿期具有 BI 特征的儿童在后期更容易表现出社交退缩或焦虑,且对威胁刺激的注意偏向可能会调节这一关联<sup>[49]</sup>。此外,高害羞气质(temperamental shyness)的儿童在 4~7 岁时对愤怒面孔有更大的注意偏向<sup>[50]</sup>。

3.1.3 睡眠 睡眠问题与情绪问题密切相关,这一特征在生命早期即开始显现。研究发现,3~5 岁儿童在小睡剥夺后表现出对情绪刺激的注意偏向,且在有小睡习惯的儿童中更加明显<sup>[51]</sup>。眼动追踪研究表明,频繁夜醒的婴儿对恐惧面孔的注意偏向比

正常儿童更明显<sup>[52]</sup>。此外,对成年失眠患者进行的研究发现,睡眠问题会导致个体出现对睡眠相关负性信息的注意偏向<sup>[53]</sup>。

#### 3.2 家庭环境因素

3.2.1 养育人心理健康 研究发现,主要养育人尤其是母亲的心理健康与婴儿对情绪面孔的注意有关,母亲围生期抑郁、焦虑程度越高、压力越大的婴儿对负性情绪面孔(恐惧或愤怒)的注意偏向越明显<sup>[54-55]</sup>。此外,母亲重度抑郁的青少年也表现出对悲伤面孔的注意偏向<sup>[56]</sup>。然而,也存在不一致的研究结果。例如,一项在 5~36 月龄婴儿中进行的研究未发现母亲焦虑症状与婴儿情绪注意偏向之间的关系<sup>[57]</sup>;另一项研究发现母亲孕期妊娠相关焦虑高的婴儿对情绪面孔的注意减少<sup>[58]</sup>。

3.2.2 养育环境 在发展过程中,个体可能更加适应环境中频繁出现的面部表情。早期暴露于威胁环境可能会促进个体对环境中的威胁线索的快速识别。研究发现,遭受家庭暴力或其他早期生活压力的儿童对愤怒或悲伤的面孔有更强的注意偏向<sup>[59-60]</sup>,而这可能受年龄的调节;年龄小的儿童更多表现为对威胁刺激的注意偏向,而年龄较大的青少年则更多表现为对威胁刺激的注意回避<sup>[61]</sup>。此外,有研究发现消极的养育方式和行为与对愤怒面孔的注意偏向有关<sup>[62]</sup>。

综上所述,负性情绪注意偏向在儿童早期即已出现并迅速发展,随后其强度逐渐下降且趋于稳定。作为情绪调节能力的关键部分,负性情绪注意偏向对儿童的社会情绪发展及心理健康有重要作用。性别、气质、睡眠、养育人心理健康及养育环境等因素会影响儿童负性情绪注意偏向,但不同因素作用大小、相互作用关系及潜在神经机制均有待深入研究。最后,当前对负性情绪注意偏向的研究结论并不一致,且纵向研究较少。因此,未来需要更多纵向研究,结合先进的脑科学技术,探究婴幼儿情绪注意偏向的发展特点及神经机制。

#### 参考文献

- [1] Vos T, Abajobir AA, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990—2016: A systematic analysis for the global burden of disease study 2016[J]. *Lancet*, 2017, 390(10100): 1211-1259.
- [2] Baranne ML, Falissard B. Global burden of mental disorders among children aged 5-14 years[J]. *Child Adolesc Psychiatry Ment Health*, 2018, 12:19.
- [3] Li F, Cui Y, Li Y, et al. Prevalence of mental disorders in school children and adolescents in China: Diagnostic data from detailed clinical assessments of 17,524 individuals[J]. *J*

- Child Psychol Psychiatry, 2021, 63(1): 34-46.
- [4] Deng Y, Zhang Z, Gui Y, et al. Sleep disturbances and emotional and behavioral difficulties among preschool-aged children[J]. JAMA Netw Open, 2023, 6(12): e2347623.
  - [5] Carter AS, Briggs-Gowan MJ, Davis NO. Assessment of young children's social-emotional development and psychopathology: Recent advances and recommendations for practice[J]. J Child Psychol Psychiatry, 2004, 45(1): 109-134.
  - [6] Calkins SD, Hell A. Caregiver influences on emerging emotion regulation: Biological and environmental transactions in early development [M]//Gross JJ. Handbook of emotion regulation. New York: Guilford Publications, 2007.
  - [7] 彭晓哲, 周晓林. 情绪信息与注意偏向[J]. 心理科学进展, 2005, 13(4): 488-496.  
Peng XZ, Zhou XL. Emotional information and attentional bias[J]. Advances in Psy-Chological Science, 2005, 13(4): 488-496. (in Chinese)
  - [8] Wadlinger HA, Isaacowitz DM. Fixing our focus: Training attention to regulate emotion[J]. Pers Soc Psychol Rev, 2010, 15(1): 75-102.
  - [9] Bar-Haim Y, Lamy D, Pergamin L, et al. Threat-related attentional bias in anxious and nonanxious individuals: A Meta-analytic study[J]. Psychol Bull, 2007, 133(1): 1-24.
  - [10] Clark DA, Beck AT, Alford BA, et al. Scientific foundations of cognitive theory and therapy of depression[J]. J Cogn Psychother, 2000, 14(1): 100-106.
  - [11] Beck AT, Clark DA. An information processing model of anxiety: Automatic and strategic processes[J]. Behav Res Ther, 1997, 35(1): 49-58.
  - [12] Lisk S, Vaswani A, Linetzky M, et al. Systematic review and Meta-analysis: Eye-tracking of attention to threat in child and adolescent anxiety[J]. J Am Acad Child Adolesc Psychiatry, 2020, 59(1): 88-99.
  - [13] Grossmann T, Missana M, Krol KM. The neurodevelopmental precursors of altruistic behavior in infancy [J]. PLoS Biol, 2018, 16(9): e2005281.
  - [14] Eskola E, Kataja E-L, Hyönä J, et al. Higher attention bias for fear at 8 months of age is associated with better socioemotional competencies during toddlerhood[J]. Infant Behav Dev, 2023, 71: 101838.
  - [15] Waters AM, Candy EM, Candy SG. Attention bias to threat in mothers with emotional disorders predicts increased offspring anxiety symptoms: A joint cross-sectional and longitudinal analysis[J]. Cogn Emot, 2018, 32(4): 892-903.
  - [16] Waters AM, Forrest K, Peters RM, et al. Attention bias to emotional information in children as a function of maternal emotional disorders and maternal attention biases[J]. J Behav Ther Exp Psychiatry, 2015, 46: 158-163.
  - [17] Hang Y, Zhang G, Wang C, et al. Attention bias modification for anxiety disorders in children and adolescents: A systematic review and Meta-analysis[J]. Psychiatry Res, 2021, 300: 113896.
  - [18] De Voogd EL, Wiers RW, Salemink E. Online visual search attentional bias modification for adolescents with heightened anxiety and depressive symptoms: A randomized controlled trial[J]. Behav Res Ther, 2017, 92: 57-67.
  - [19] Rigato S, Menon E, Johnson MH, et al. The interaction between gaze direction and facial expressions in newborns [J]. Eur J Dev Psychol, 2011, 8(5): 624-636.
  - [20] Xie W, McCormick SA, Westerlund A, et al. Neural correlates of facial emotion processing in infancy[J]. Dev Sci, 2018, 22(3): e12758.
  - [21] Kuchuk A, Vibbert M, Bornstein MH. The perception of smiling and its experiential correlates in three-month-old infants[J]. Child Dev, 1986, 57(4): 1054-1061.
  - [22] Safar K, Moulson MC. Three-month-old infants show enhanced behavioral and neural sensitivity to fearful faces[J]. Dev Cogn Neurosci, 2020, 42: 100759.
  - [23] Vaish A, Grossmann T, Woodward A. Not all emotions are created equal: The negativity bias in social-emotional development[J]. Psychol Bull, 2008, 134(3): 383-403.
  - [24] Leppänen JM, Nelson CA. The development and neural bases of facial emotion recognition[J]. Adv Child Dev Behav, 2006, 34: 207-246.
  - [25] Heck A, Hock A, White H, et al. The development of attention to dynamic facial emotions[J]. J Exp Child Psychol, 2016, 147: 100-110.
  - [26] Bornstein MH, Arterberry ME. Recognition, discrimination and categorization of smiling by 5-month-old infants [J]. Dev Sci, 2003, 6(5): 585-599.
  - [27] Miguel HO, McCormick SA, Westerlund A, et al. Rapid face processing for positive and negative emotions in 5-, 7-, and 12-month-old infants: An exploratory study[J]. Br J Dev Psychol, 2019, 37(4): 486-504.
  - [28] Aran Ö, Garcia SE, Hankin BL, et al. Signatures of emotional face processing measured by event-related potentials in 7-month-old infants [J]. Dev Psychobiol, 2022, 65(2): e22361.
  - [29] Leppänen JM, Moulson MC, Vogel-Farley VK, et al. An ERP study of emotional face processing in the adult and infant brain[J]. Child Dev, 2007, 78(1): 232-245.
  - [30] Nakagawa A, Sukigara M. Attentional bias assessed by a facial expression cuing paradigm in infants[J]. Sci Rep, 2019, 9(1): 68.
  - [31] Lobue V, Deloache JS. Superior detection of threat-relevant stimuli in infancy [J]. Dev Sci, 2009, 13(1): 221-228.
  - [32] Wang L, Hsiao JH, Chan AB, et al. On becoming socially anxious: Toddlers' attention bias to fearful faces[J]. Dev Psychol, 2023, 59(2): 353-363.
  - [33] Kobiella A, Grossmann T, Reid VM, et al. The discrimination of angry and fearful facial expressions in 7-month-old infants: An event-related potential study[J]. Cognition and Emotion, 2007, 22(1): 134-146.
  - [34] Kataja E-L, Eskola E, Pelto J, et al. The stability of early developing attentional bias for faces and fear from 8 to 30 and 60 months in the Finn Brain Birth Cohort Study[J]. Dev Psychol, 2022, 58(12): 2264-2274.
  - [35] Morales S, Fu X, Pérez-Edgar KE. A developmental neuroscience perspective on affect-biased attention [J]. Dev

- Cogn Neurosci, 2016, 21: 26-41.
- [36] Reider LB, Bierstedt L, Burris JL, et al. Developmental patterns of affective attention across the first 2 years of life[J]. *Child Dev*, 2022, 93(6): e607-e621.
- [37] Rothbart MK, Sheese BE, Rueda MR, et al. Developing mechanisms of self-regulation in early life[J]. *Emot Rev*, 2011, 3(2): 207-213.
- [38] Kindt M, Van Den Hout M. Selective attention and anxiety: A perspective on developmental issues and the causal status[J]. *J Psychopathol Behav Assess*, 2001, 23(3): 193-202.
- [39] Macleod C, Rutherford E, Campbell L, et al. Selective attention and emotional vulnerability: Assessing the causal basis of their association through the experimental manipulation of attentional bias[J]. *J Abnorm Psychol*, 2002, 111(1): 107-123.
- [40] Mathews A, Macleod C. Cognitive vulnerability to emotional disorders[J]. *Annu Rev Clin Psychol*, 2005, 1(1): 167-195.
- [41] Plate Ra-O, Powell T, Bedford R, et al. Social threat processing in adults and children: Faster orienting to, but shorter dwell time on, angry faces during visual search[J]. *Dev Sci*, 2024, 27(3): e13461.
- [42] Sylvester CM, Hudziak JJ, Gaffrey MS, et al. Stimulus-Driven attention, threat bias, and sad bias in youth with a history of an anxiety disorder or depression[J]. *J Abnorm Child Psychol*, 2015, 44(2): 219-231.
- [43] Abend R, De Voogd L, Salemin E, et al. Association between attention bias to threat and anxiety symptoms in children and adolescents[J]. *Depress Anxiety*, 2018, 35(3): 229-238.
- [44] Azriel O, Arad G, Pine DS, et al. Attention bias vs. attention control modification for social anxiety disorder: A randomized controlled trial[J]. *J Anxiety Disord*, 2024, 101.
- [45] Waters AM, Lipp OV, Spence SH. Attentional bias toward fear-related stimuli: An investigation with nonselected children and adults and children with anxiety disorders[J]. *J Exp Child Psychol*, 2004, 89(4): 320-337.
- [46] 史雅静, 张灵聪, 武海英. 心理弹性、性别对情绪信息注意偏向的影响——基于情绪 Stroop 的实验研究[J]. *天水师范学院学报*, 2014, 34(5): 114-118.
- Shi YJ, Zhang LC, Wu HY. Effect of different emotional arousal to mental resilience and gender of college students bias in the information note[J]. *J Tianshui Normal University*, 2014, 34(5): 114-118. (in Chinese)
- [47] Hankin BL, Abramson LY. Development of gender differences in depression: Description and possible explanations[J]. *Ann Med*, 1999, 31(6): 372-379.
- [48] Pérez-Edgar K, Morales S, Lobue V, et al. The impact of negative affect on attention patterns to threat across the first 2 years of life[J]. *Dev Psychol*, 2017, 53(12): 2219-2232.
- [49] Rayson H, Ryan ZJ, Dodd HF. Behavioural inhibition and early neural processing of happy and angry faces interact to predict anxiety: A longitudinal ERP study[J]. *Dev Cogn Neurosci*, 2023, 60: 101207.
- [50] Lobue V, Pérez-Edgar K. Sensitivity to social and non-social threats in temperamentally shy children at-risk for anxiety[J]. *Dev Sci*, 2013, 17(2): 239-247.
- [51] Cremone A, Kurdziel LBF, Fraticelli-Torres A, et al. Napping reduces emotional attention bias during early childhood[J]. *Dev Sci*, 2016, 20(4): 10.1111/desc.12411.
- [52] Mäkelä TE, Kylliäinen A, Saarenpää-Heikkilä O, et al. Signaled night awakening and its association with social information processing and socio-emotional development across the first two years[J]. *Sleep*, 2021, 44(12): zsab179.
- [53] Akram U, Beattie L, Ypsilanti A, et al. Sleep-related attentional bias for tired faces in insomnia: Evidence from a dot-probe paradigm[J]. *Behav Res Ther*, 2018, 103: 18-23.
- [54] Reilly EB, Dickerson KL, Pierce LJ, et al. Maternal stress and development of infant attention to threat-related facial expressions[J]. *Dev Psychobiol*, 2022, 64(7): e22332.
- [55] Kataja EL, Karlsson L, Leppänen JM, et al. Maternal depressive symptoms during the pre- and postnatal periods and infant attention to emotional faces[J]. *Child Dev*, 2020, 91(2): e475-e480.
- [56] Gibb BE, Owens M, Brick LaD. Attentional biases for sad faces in offspring of mothers with a history of major depression: Trajectories of change from childhood to adolescence[J]. *J Child Psychol Psychiatry*, 2022, 64(6): 859-867.
- [57] Leppänen JM, Cataldo JK, Bosquet Enlow M, et al. Early development of attention to threat-related facial expressions[J]. *PLoS One*, 2018, 13(5): e0197424.
- [58] Hennessey E-MP, Swales DA, Markant J, et al. Maternal anxiety during pregnancy predicts infant attention to affective faces[J]. *J Affect Disord*, 2024, 344: 104-114.
- [59] Wade M, Wright L, Finegold KE. The effects of early life adversity on children's mental health and cognitive functioning[J]. *Transl Psychiatry*, 2022, 12(1): 244.
- [60] BriggsGowan MJ, Pollak SD, Grasso D, et al. Attention bias and anxiety in young children exposed to family violence[J]. *J Child Psychol Psychiatry*, 2015, 56(11): 1194-1201.
- [61] Weissman DG, Bitran D, Miller AB, et al. Difficulties with emotion regulation as a transdiagnostic mechanism linking child maltreatment with the emergence of psychopathology[J]. *Dev Psychopathol*, 2019, 31(3): 899-915.
- [62] Gulley LD, Oppenheimer CW, Hankin BL. Associations among negative parenting, attention bias to anger, and social anxiety among youth[J]. *Dev Psychol*, 2014, 50(2): 577-585.

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