

Abstract

Abstract of thesis entitled:

The effectiveness of a Chinese App version of *The Transporters* on improving emotion recognition in ASD children with and without comorbid ADHD

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Purpose: *The Transporters* intervention is an animated series for training emotion understanding and emotion recognition skills in young children with Autism Spectrum Disorders (ASD). The current study evaluated the effectiveness of a Cantonese-Chinese translated Mobile App of *The Transporters* to improve emotion understanding and emotion recognition among ASD children with and without comorbid ADHD.

Methods: Participants in the ASD treatment group (n=25) and ASD+ADHD treatment group (n=20), aged 4-6, were assigned to watch a minimum of 3 episodes per day for 4 weeks. An ASD randomized control group (n=21) watched videos of moving transportation with no illustrative stories for the same period. An age-matched typically developing (TD) group (n=23) did not receive any training. All groups were assessed at pre- and post-intervention on cognitive measures of emotion vocabulary and emotion recognition, parent-rated social behaviours, and event-related potentials (ERP) were recorded.

EFFECTIVENESS OF CHINESE APP VERSION OF THE TRANSPORTERS

Results: Both ASD and ASD+ADHD treatment group improved significantly on cognitive measures of emotion vocabulary and emotion recognition upon *The Transporters* intervention, while the ASD control group who watched control videos did not. Both ASD and ASD+ADHD treatment participants were able to catch up to the performance of TD children for all cognitive measures after intervention. Emotion recognition skills were found to be generalized to novel situations and characters not taught within *The Transporters*. Treatment gains were found across basic, complex emotions and mental states, suggesting that *The Transporters* can improve understanding and recognition of more complex emotions that depend on contexts and beliefs. The lack of a significant, linear dose-response relationship supports *The Transporters* as a low intensity intervention, in that watching 3 episodes per day for 4 weeks has shown significant effectiveness. There was however no statistically significant change in ERPs and parent-rated social behaviours post-intervention.

Conclusions: The current study confirmed the treatment effectiveness of the Chinese mobile App version of *The Transporters* to improve emotion vocabulary and emotion recognition skills among ASD children in Hong Kong. It also proved that *The Transporters* was equally effective as an intervention for ASD children with comorbid ADHD, a clinical group for which *The Transporters* had not been evaluated. Emotion recognition skills were found to be generalizable across novel social contexts and characters, a finding that is less reported in literature. Significant improvement was found across all emotions, including complex emotions which are situation and belief-dependent, highlighting the importance of illustrative stories of *The Transporters* in linking emotions to contexts and beliefs. *The Transporters* is cost/resource efficient given the short duration and intensity (3 episodes per day for 4 weeks,) required for

EFFECTIVENESS OF CHINESE APP VERSION OF THE TRANSPORTERS

significant effect. The lack of positive findings in improvements in social behaviours as measured by the SCQ may reflect a measurement issue, and may also suggest that emotion recognition is an integral part of a complex process of social functioning. The current study took an exploratory but unsuccessful attempt to link performance-based measures to neurological measures of face and emotion processing, and the suitability of the current EEG paradigm for measuring treatment effects and diagnostic group differences within a relatively young age group should be revisited.

Keywords: Autism Spectrum Disorder, Attention Deficit Hyperactivity Disorder, ASD, ADHD, ASD and ADHD Comorbidity, The Transporters, Effectiveness Study

論文摘要

The Transporters 動畫系列用於訓練自閉症谱系障礙 (ASD) 幼兒的情感理解和情緒識別技能。過往的研究已經證明 The Transporters 能有效地提升西方 ASD 兒童的情感理解和情緒識別的能力。目前的研究評估了 The Transporters 的中文粵語翻譯版本之應用程式，能否有效地提升香港的自閉症谱系障礙 (ASD) 以及 共同患有自閉症谱系障礙 (ASD)及專注力不足/過度活躍症的兒童的情緒理解和情緒識別能力, 日常社交行爲，以及能反映對人面識別敏感度的 N170 事件相关电位 (event-related potentials, ERPs)。

25 名被診斷為自閉症谱系障礙 (ASD) 與 20 名被診斷為共同患有自閉症谱系障礙 (ASD)及專注力不足/過度活躍症，介為 4 至 6 歲的兒童為實驗組，被安排使用 The Transporters 應用程式，一連 4 個星期每天觀看至少 3 集的短片。研究結果發現兩個實驗組的兒童在 4 星期后，在情感理解和情緒識別的能力上都有明顯的進步。相反地，另外 20 名被診斷為自閉症谱系障礙 (ASD) 的對照組兒童，被安排一連 4 個星期觀看欠缺人物與故事的交通工具短片，卻沒有明顯的進步。實驗組的兒童用完 The Transporters 應用程式后，與正常兒童對照組有著相約的情感理解和情緒識別的表現，這表示 The Transporters 能有效地改善自閉症谱系障礙 (ASD)與共同患有自閉症谱系障礙 (ASD)及專注力不足/過度活躍症的兒童的情感理解和情緒識別，甚至能追上正常兒童的能力。在此研究中，實驗組兒童的社交溝通行爲問卷(SCQ)數據與 N170 ERP 數據在實驗前後沒有明顯的分別。