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摘 要 抑制控制是执行功能的重要组成部分之一，研究表明抑制控制与额叶区域的活动有关。经颅直流电刺激(Transcranial Direct Current Stimulation, tDCS)是一种非侵入性的脑刺激技术，可以调节脑区的激活程度。研究表明 tDCS 刺激额叶的部分区域可以有效干预参与者的抑制控制水平，而这一干预作用会受到刺激位置、刺激类型以及实验任务等条件变化的影响。目前 tDCS 已应用于不同人群的抑制控制研究，并能与其他研究技术较好的结合。

关键词 抑制控制；反应抑制；tDCS；额下回；背外侧前额叶；前辅助运动区

分类号 B845

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ɜ ɔ , ꓠ ; ṅ Ч ɟ ɜ Ά Ύ Ă ɟ ɛ , Ă ɞ Ђ ꓠ ɛ , ɞ ɛ (Aron, Robbins, & Poldrack, 2004; Logan, Schachar, & Tannock, 1997) ɟ ɛ ΰ , , Ă ɟ Ά ; (inferior frontal gyrus, IFG) Ă ɟ ɛ , ꓠ IFG (Aron, Fletcher, Bullmore, Sahakian, & Robbins, 2003; Zhu, Zacks, & Slade, 2010) ɟ ʂ ΰ IFG ɟ Roberts Wallis (2000) IFG ɔ ; Aron (2003) IFG Ά Ά ɛ , ʂ ɟ

IFG ẹ ˩ Ά ɟ (Tractography) pre-SMA Ά IFG , ɜ ʂ IFG Ά ˩ (pre-supplementary motor area, pre-SMA) (Aron, Behrens, Smith, Frank, & Poldrack, 2007; Li et al., 2008) ɟ Floden Stuss (2006) ɔ ˩ ẹ pre-SMA ꓠ ɔ ɟ ṅ ṅ Ă , pre-SMA ꓠ , pre-SMA ṅ ꓠ (Sumner et al., 2007) ɟ (dorsolateral prefrontal cortex, dlPFC) ʂ ɟ ɛ dlPFC ꓠ ꓠ , Ά ɞ ˩ (y) y ɛ (Bechara, 2005; Wood & Grafman, 2003) ɟ ɜ , dlPFC ɔ , ɛ ɦ , ʂ dlPFC Ά Ă (Floden & Stuss, 2006; Shimamura, Jurica, Mangels, Gershberg, & Knight, 1995) ɟ ʂ dlPFC ꓠ (Friese, Binder, Luechinger, Boesiger, & Rasch, 2013; Knoch, Pascual-Leone, Meyer, Treyer, & Fehr, 2006) ɟ

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(Aron & Poldrack, 2006; Chikazoe et al., 2009; Zandbelt, Bloemendaal, Hoogendam, & Vink, 2013) (2)

2 tDCS

(Transcranial Direct Current Stimulation, tDCS) tDCS, tDCS tDCS (Priori, Hallett, & Rothwell, 2009) (Woods et al., 2016) tDCS (Zmigrod, Colzato, & Hommel, 2014) (Juan & Muggleton, 2012) tDCS tDCS

1 (Aron, 2007)

pre-SMA rIFG dlPFC (STN) (Aron & Poldrack, 2006; Li, Huang, Constable, & Sinha, 2006; Li et al., 2008) (fronto-basal ganglia model) (Go Process) (Stopping Process) (premotor cortex) (Str) (GPi), IFG STN (1, Aron,2007; Aron, Durston, et al., 2007) IFG pre-SMA dlPFC

2

┘ , ҥ ┘ ą
, ъ ┘ Ά ˜ -
ɟ tDCS ṇ IFG,
IFG ą , STN
, ъ ą ,
, (Chambers, Garavan,
& Bellgrove, 2009) ɟ 10 , tDCS
,
Ą ɟ
, tDCS
ζ Stop Signal (SST) Go/No-Go
(GNG) ɟ Stop Signal ,
Ά ˝ ˜ ◗
א , ę א
(reactive inhibition), ◗
א ; Go/No-Go ,
Ά Θ ; ˝ א ,
ę ζ (proactive inhibition),
◗ א
(Cunillera, Fuentemilla, Brignani, Cucurell, &
Miniussi, 2014; , , 2015) ɟ

2.1 tDCS

tDCS

Campanella (2017) Cunillera (2014) Stop-Signal Go/No-Go , GNG-SST , IFG Go/No-Go Stop Signal , IFG (Cunillera, Brignani, Cucurell, Fuentemilla, & Miniussi, 2016) , , IFG Go/No-Go , Stop Signal GNG-SST Go/No-Go Stop Signal , , tDCS tDCS , Ditye, Jacobson, Walsh Lavidor (2012) tDCS 4 IFG , , tDCS tDCS , tDCS (70.68±3.5) IFG Stop Signal Go/No-Go tDCS (Geusens & Swinnen, 2014) tDCS , , IFG tDCS , IFG , 10-20 “T3-Fz F7-Cz /T4-Fz F8-Cz ” “F7/F8” , ,

2.2 tDCS

Pre-SMA , pre-SMA (Nachev, Wydell, O’Neill, Husain, & Kennard, 2007; Obeso et al., 2011) tDCS , pre-SMA tDCS pre-SMA Stop Signal , , pre-SMA

Hsu (2011) Pre-SMA tDCS , Pre-SMA , TMS , , tDCS , Pre-SMA Kwon 2013 , tDCS pre-SMA Stop Signal , Stop Signal SSRT (Kwon & Kwon, 2013a) pre-SMA , tDCS Kwon Pre-SMA tDCS , (primary sensorimotor cortex, M1) , (Kwon & Kwon, 2013b)

Liang (2014) , tDCS (multiscale entropy, MSE) MSE , MSE (Peng, Costa, & Goldberger, 2009) Pre-SMA tDCS Go MSE, Stop MSE

Pre-SMA
tDCS fMRI
, pre-SMA
SSRT , pre-SMA
(vmPFC) , tDCS
pre-SMA vmPFC

2.3 tDCS
dlPFC fMRI
dlPFC Stroop
, (MacDonald, Cohen, Stenger, & Carter, 2000);
dlPFC No-Go Go
, dlPFC
(Asahi, Okamoto, Okada, Yamawaki, & Yokota, 2004) Bush Shin (2006) ,
95% dlPFC
tDCS , dlPFC tDCS
dlPFC tDCS
tDCS Go/No-Go
Soltaninejad, Nejati Ekhtiari (2015)
dlPFC tDCS ADHD
, , dlPFC Go/
No-Go Go ,
dlPFC No-Go
dlPFC
Nieratschker, Kiefer, Giel, Krüger
Plewnia (2015) Go/No-Go ,
dlPFC
, Flanker Go/No-Go ,
dlPFC
, 1 mA 1.5 mA 2 mA
, tDCS
, (Karuza et al., 2016)
tDCS
dlPFC Go/No-Go
Lapenta, Sierve, de Macedo, Fregni Boggio (2014)
dlPFC tDCS
, dlPFC dlPFC
, Go/No-Go
Cosmo
(2015) ADHD tDCS
dlPFC , Go/No-Go
dlPFC
Beeli
, dlPFC
tDCS Go/No-Go ,
, dlPFC
(Beeli, Casutt, Baumgartner, & Jäncke, 2008)
, tDCS dlPFC
dlPFC
Go/No-Go dlPFC
, Stop Signal Stramaccia
(2015) IFG dlPFC
tDCS Stop Signal
, IFG
SSRT, dlPFC
IFG
, dlPFC
, IFG , dlPFC
, Stroop
MSIT), tDCS dlPFC
(Brunyé, Cantelon, Holmes, Taylor, & Mahoney, 2014; Loftus, Yalcin, Baughman, Vanman, & Hagger, 2015; Oldrati, Patricelli, Colombo, & Antonietti, 2016)

3 tDCS

3.1 tDCS ADHD

,
(attention deficit hyperactivity disorder, ADHD) (Major depressive disorder, MDD) (Tourette syndrome, TS)
(autism spectrum disorder, ASD)
(Agam, Joseph, Barton, & Manoach, 2010; Ganos et

al., 2014; Kalu, Sexton, Loo, & Ebmeier, 2012; Palm et al., 2016; Yasumura et al., 2014) ɟ , ADHD ˙ ɔ (Barkley, 1997; Shimoni, Engel-Yeger, & Tirosh, 2012) ɟADHD , ę ɥ ; , ɣ ɟ , ADHD ˜ ⌟ ɥ , ę ɔ (Cubillo et al., 2014) ɟ ADHD (Barkley, 1997; Yasumura et al., 2014), (Mannuzza, Klein, & Moulton, 2003) ɟ , ADHD Stroop Ά (Yasumura et al., 2014) ɟ , Ά , ADHD Flanker א (Mullane, Corkum, Klein, & Mclaughlin, 2009) ɟ tDCS ADHD ˙ ADHD , ς ε ADHD ʒ (Vicario & Nitsche, 2013) ɟBreitling (2016) tDCS ṇ IFG ADHD ɟ , ADHD Ά Ά ŭ ɔ tDCS ɷ ṇ , Flanker ɟ ṇ ADHD ṇ ɥ א ɟ , ADHD ε Ά , ADHD ɟ tDCS ṇ IFG ADHD ɟ tDCS ṇ dlPFC ς ADHD ɟ , ADHD dlPFC ɔ tDCS ṇ ˜ Go/No-Go , dlPFC ṇ Go/No-Go “Go ” ; dlPFC ɵ ṇ Go/No-Go “No-Go ” ɟ ṇ ADHD dlPFC ę (Soltaninejad et al., 2015) ɟ Nejati, Salehinejad, Nitsche, Najian Javadi (2017) tDCS ṇ ADHD dlPFC, ṇ ADHD Stroop , ę ɔ ; ṇ Go/No-Go , א ɔ tDCS ɟ Bandeira (2016) , Ά 9˜ ADHD ɟ 5 tDCS ⌞ ɟ tDCS 5 ŭ , DLPFC , ɵ ɟ ŭ ṇ ˜ , tDCS ṇ ˜ ɟ ʒ tDCS ADHD ṇ (Cosmo et al., 2015; Soltaninejad et al., 2015) ɟ ADHD tDCS , tDCS ADHD ɟ

3.2 tDCS

tDCS MDD ɷ TS ASD ę ς ɟ tDCS ę ṇ ɷ , ę Ă ɟ ε Ά Ă (Langenecker et al., 2005) ɟ

(Langenecker et al., 2007; B. W. Zhang, Xu, & Chang, 2016) ɟ ε , ę ж ς (Mayberg, 2007; Quinn, Harris, & Kemp, 2012) ɟ :tDCS ṇ DLPFC ṇ ɥ DLPFC (Brunoni, Ferrucci, Fregni, Boggio, & Priori, 2012) ɟ ŭ , tDCS Ė τ (Brunoni et al., 2016; Kalu et al., 2012) ɟ TS ɟ ŭ , TS ε ẇ , ę , TS Ά ADHD TS (Morand-Beaulieu et al., 2017) ɟ TS

, SST , TS
(Ganos et al., 2014)
Eapen (2017) tDCS TS
TS 6 tDCS 3 tDCS
Go/No-Go
, SMA
20 tDCS 3 6
No-Go
; , 3

ASD ,
(Muszkat, Polanczyk, Dias, & Brunoni, 2016) ASD
,
ASD ACC PFC
(Agam et al., 2010; Thakkar et al., 2008) , ASD
,
(Christ, Holt, White, & Green, 2007; Padmanabhan et al., 2015; Schmitt, White, Cook, Sweeney, & Mosconi, 2018) tDCS
ASD
, Schneider Hopp (2011) ASD
tDCS ,
16-21 10 ASD
tDCS ,
,
dlPFC ASD
(Amatachaya et al., 2014; Amatachaya et al., 2015; Costanzo et al., 2015; Hameed et al., 2017)
tDCS
, tDCS
,
, MDD TS
ASD
, tDCS
, tDCS
tDCS

4 tDCS

tDCS
tDCS
(functional Near-Infrared Spectroscopy, fNIRS) (functional magnetic resonance imaging, fMRI) (Electroencephalogram, EEG) (Nitsche & Paulus, 2011); , fMRI tDCS
tDCS ,
tDCS (Woods et al., 2014)

4.1 tDCS-EEG

, EEG
tDCS EEG tDCS
, EEG
,
,
tDCS
,
(Miniussi, Brignani, & Pellicciari, 2012; Woods et al., 2016)
ERP
Go/No-Go , N2
P3 NoGo ; Go
(Falkenstein, Hoormann, & Hohnsbein, 2002) , No-Go ; N2
, , N2
,
(Donkers & van Boxtel, 2004; Huster, Enriquez-Geppert, Lavallee, Falkenstein, & Herrmann, 2013; Zhang & Lu, 2012) No-Go P3 ,
P3,
(Smith, Jamadar, Provost, & Michie, 2013; Smith, Johnstone, & Barry, 2008) , No-Go ; ,
P3 (Dimoska, Johnstone, Barry, & Clarke, 2003; Greenhouse & Wessel, 2013; Wessel & Aron, 2015) tDCS
, N2 P3 No-Go

Θ Ά Go Θ ; ɔ tDCS ɟ
ε NoGo Θ Ά Go Θ ;
, N2 P3 ΰ N2d P3d
(Campanella et al., 2017) ɟ
Cunillera (2016) ,
Stop Signal Go/No-Go IFG
א , tDCS
IFG EEG ܗ ɟ IFG tDCS
ῃ ζ , ζ א
Θ ; , tDCS P3
ɟ ς ɟ
Ά tDCS ῃ IFG ˜ ΰ Go/
No-Go EEG, tDCS ῃ
˜ Go/No-Go , P3d ɥ tDCS
, ɔ tDCS ῃ
Ά (Campanella et al., 2017) ɟ
IFG tDCS ῃ א
א ɟ
EEG ΰ ς Ặ ɟ
θ Ά ε Ặ,
א θ ɥ ' (Lansbergen, Schutter, & Kenemans, 2007) ɟ Jacobson, Ezra, Berger Lavidor (2012) , Ά
ɔ IFG 15 ΰ tDCS ῃ ˜
15 ΰ EEG, Ά
IFG ┘ θ ' ɥ ɟ
tDCS ῃ Θ ;
EEG ΰ ɟ

4.2 tDCS-fMRI

, tDCS ῃ ש ῃ ˜
' ל (Peña-Gómez et al., 2012; Sehm et al., 2012),
ε , tDCS
щ ɟ tDCS
Ά ' Ỷ ɟ ε
'
, fMRI Ά tDCS ε tDCS
ΰ ɟ tDCS
Ά fMRI ΰ tDCS
(Sehm, Kipping, Schäfer, Villringer, & Ragert, 2013) ɟ ῃ ῃ ˜ fMRI
┘ , Ά ε Ặ
ɟ fMRI tDCS ῃ

' ל (Meinzer et al., 2014) ɟ
tDCS-fMRI
ɟ Yu, Tseng, Hung, Wu Juan (2015)
tDCS fMRI
pre-SMA א ɟ ,
tDCS ῃ pre-SMA Ά
; fMRI pre-SMA ┘ ῃ ˜
, Ά א
˜ (ventromedial prefrontal cortex, vmPFC) ῃ ˜
, pre-SMA Ά vmPFC '
ɟ ვ ῃ pre-SMA
ε Ά pre-SMA Ά vmPFC
' Ặ ɟ
tDCS-fMRI щ
ɟ Antal (2014) , tDCS ῃ
fMRI (echo-planar imaging, EPI), tDCS fMRI
ɟ fMRI
, Ỷ ɟ

4.3 tDCS-fNIRS

tDCS ל
ɟ ל
˜ ┘ (regional cerebral blood ow, rCBF) ש ל , ვ ל
fNIRS , ┘
(Merzagora et al., 2010) ɟ ς , rCBF ,
tDCS ῃ ˜ ɟfNIRS
f Á➤ca⊘T66gЂMÃ'gRÀ + -A/£/£ Z gÀ̄M5

Parasuraman, & Ayaz, 2015) ɟ
ʒ fNIRS Ά tDCS
ɟ Merzagora (2010) fNIRS
˜ ṭ ˜ tDCS ˜
ɟ , fNIRS ˈ tDCS ṭ
ƾ , tDCS
HbO2 ɟ ,
ṭ
ɟJones, Gozenman Berryhill (2015) fNIRS
ˆ Ά ɔ tDCS
, Ά
tDCS ˜ ƾ , ɦ
Ά tDCS ˜
ɟ
, ʒ fNIRS Ά
tDCS ,
,
ę ƾ ɟ

5

10 tDCS
ɟ tDCS ṭ Ά
IFG ɞdlPFC pre-SMA ┘ , ʒ ┘
ɟ ,
tDCS IFG ┘ ą̆ Stop
Signal ε Go/No-Go
ε , IFG Stop Signal
א
ɟ tDCS dlPFC
Go/No-Go Stop Signal
, dlPFC ζ Ą̇
ɟ ʒ tDCS pre-SMA
Stop Signal א
, pre-SMA ζ
ɟ ε “ ˜ - ”
ṭ ɟ
IFG dlPFC ς
,
ɟ
tDCS ę
, ┘ ,
ę ɟ
ADHD , tDCS
IFG dlPFC ,
ɟ tDCS
10 ŏ ,
τ , ɯ
ɟ

5.1 tDCS

ˆ , tDCS ˆ
ɟ ṭ
Ά ┘ ˈ Ɦ, dlPFC
┘ ┘ (Brodmann's area, BA) 9
┘ 46 ┘ , dlPFC
, ṭ
BA9 ┘ BA46 ┘ ŏ
(Bari & Robbins, 2013) ɟ ε tDCS
, tDCS
(HD-tDCS) ɟ tDCS
4-1 ṭ ,
┘ ṭ ṭ
ɟ 25% (
, , ʜ , 2016) ɟ , HD-
tDCS Ɓ tDCS ɟ
ε , Hogeveen (2016)
ς ŏ HD-tDCS Ά tDCS Ė ˀ
ɟ HD-tDCS Ά tDCS
ŏ ,
ɟ

5.2

ɔ , ˆ , ɾ
tDCS ,
ˆ ˆ ṭ Ɦ ,
ɟ ,
ʒ ɵ
ɟ , tDCS
ṭ ┘ , ṭ ┘
ɟ ,
ɟ tDCS ṭ IFG , ṭ Stop
Signal ε ɔ , ṭ
(Cai et al., 2016; Castro-Meneses, Johnson, & Sowman, 2016; Ditye et al., 2012; Hogeveen et al., 2016; Jacobson et al., 2011; Stramaccia et al., 2015) ɟ
ˀ ṭ IFG, Ά Go/No-Go ,
ˆ ε ƾ (Campanella et al., 2017; Dambacher et al., 2015; Geusens &

Swinnen, 2014) ɟ ˞˒
м σ , ש tDCS ῃ
м σ , З
˞ , Ϛ ˜
ɟ

5.3

, ADHD ɞ (Parkinson's disease, PD) ɞ (Alazheimer's disease, AD)
ˈ ɟtDCS ɛ
ῃ , ˞˒
(Breitling et al., 2016) ɟ З ɛ , tDCS ɛ
ɟ ˈ ,
tDCS ┘
, ẹ Ϛ
ɟ tDCS ῃ
IFG ɞ dlPFC ┘ ADHD
, З ┘ ῃ ẹ
, , щ
ɟ

5.4 tDCS

ל ɟ
Ϛ , ẹ Ά Ặ
U (van de Laar, van den Wildenberg, van Boxtel, Huizenga, & van der Molen, 2012) ɟ
˞ א ъ ,
˜ ɟ ,
12 ˜ щ ,
˜ ɟ ,
(van de Laar et al., 2012) ɟ Ά
, ɛ ל ɟ ,
א , ל Ϛ
(Mcauley, Yap, Christ, & White, 2006; ,
, , 2014) ɟ , tDCS
ζ ,
Ặ ɟtDCS
, tDCS
, З щ ɟ

5.5 tDCS

, ɛ ˞
ɟLogan Burkell (1986) Stop Signal
Ά 6 , Stop Signal
ɛ ɟ Ditye (2012)
Ά 4
Stop Signal ɛ , tDCS
ɟ
˞˒
, tDCS
, З ΰ ɟ

, , . (2016).
. , *24*(3), 356−366

, , . (2014). - -
. , *22*(8), 1236−1245

, . (2015). ——
. , *3*(6), 991−995

Agam, Y., Joseph, R. M., Barton, J. J. S., & Manoach, D. S. (2010). Reduced cognitive control of response inhibition by the anterior cingulate cortex in autism spectrum disorders. *NeuroImage, 52*(1), 336−347

Amatachaya, A., Auvichayapat, N., Patjanasoontorn, N., Suphakunpinyo, C., Ngernyam, N., Aree-uea, B., ... Auvichayapat, P. (2014). Effect of anodal transcranial direct current stimulation on autism: A randomized double-blind crossover trial. *Behavioural Neurology, 2014*(2), 173073

Amatachaya, A., Jensen, M. P., Patjanasoontorn, N., Auvichayapat, N., Suphakunpinyo, C., Janjarasjitt, S., ... Auvichayapat, P. (2015). The short-term effects of transcranial direct current stimulation on electroencephalography in children with autism: A randomized crossover controlled trial. *Behavioural Neurology, 2015*, 928631

Antal, A., Bikson, M., Datta, A., Lafon, B., Dechent, P., Parra, L. C., & Paulus, W. (2014). Imaging artifacts induced by electrical stimulation during conventional fMRI of the brain. *NeuroImage, 85 Pt 3*, 1040−1047

Aron, A. R. (2007). The neural basis of inhibition in cognitive control. *The Neuroscientist, 13*(3), 214−228

Aron, A. R., Behrens, T. E., Smith, S., Frank, M. J., & Poldrack, R. A. (2007). Triangulating a cognitive control network using diffusion-weighted magnetic resonance imaging (MRI) and functional MRI. *Journal of Neuroscience, 27*(14), 3743−3752

Aron, A. R., Durston, S., Eagle, D. M., Logan, G. D., Stinear, C. M., & Stuphorn, V. (2007). Converging evidence for a fronto-basal-ganglia network for inhibitory control of action and cognition. *Journal of Neuroscience, 27*(44), 11860−11864

Aron, A. R., Fletcher, P. C., Bullmore, E. T., Sahakian, B. J.,

& Robbins, T. W. (2003). Erratum: Stop-signal inhibition disrupted by damage to right inferior frontal gyrus in humans. *Nature Neuroscience, 6*, 115−116

Aron, A. R., & Poldrack, R. A. (2006). Cortical and subcortical contributions to stop signal response inhibition: Role of the subthalamic nucleus. *Journal of Neuroscience, 26*(9), 2424−2433

Aron, A. R., Robbins, T. W., & Poldrack, R. A. (2004). Inhibition and the right inferior frontal cortex. *Trends in Cognitive Sciences, 8*(4), 170−177

Asahi, S., Okamoto, Y., Okada, G., Yamawaki, S., & Yokota, N. (2004). Negative correlation between right prefrontal activity during response inhibition and impulsiveness: A fMRI study. *European Archives of Psychiatry and Clinical Neuroscience, 254*(4), 245−251

Bandeira, I. D., Guimaraes, R. S. Q., Jagersbacher, J. G., Barretto, T. L., de Jesus-Silva, J. R., Santos, S. N., … Lucena, R. (2016). Transcranial direct current stimulation in children and adolescents with attention-deficit/ hyperactivity disorder (ADHD): A pilot study. *Journal of Child Neurology, 31*(7), 918−924

Bari, A., & Robbins, T. W. (2013). Inhibition and impulsivity: Behavioral and neural basis of response control. *Progress in Neurobiology, 108*, 44−79

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin, 121*(1), 65−94

Bechara, A. (2005). Decision making, impulse control and loss of willpower to resist drugs: A neurocognitive perspective. *Nature Neuroscience, 8*(11), 1458−1463

Beeli, G., Casutt, G., Baumgartner, T., & Jäncke, L. (2008). Modulating presence and impulsiveness by external stimulation of the brain. *Behavioral and Brain Functions, 4*(33), 1−7

Breitling, C., Zaehle, T., Dannhauer, M., Bonath, B., Tegelbeckers, J., Flechtner, H. H., & Krauel, K. (2016). Improving interference control in ADHD patients with transcranial direct current stimulation (tDCS). *Frontiers in Cellular Neuroscience, 10*, 72

Brunoni, A. R., Ferrucci, R., Fregni, F., Boggio, P. S. & Priori A. (2012). Transcranial direct current stimulation for the treatment of major depressive disorder: A summary of preclinical, clinical and translational findings. *Progress in Neuro-psychopharmacology and Biological Psychiatry, 39*(1), 9−16

Brunoni, A. R., Moffa, A. H., Fregni, F., Palm, U., Padberg, F., Blumberger, D. M., ... Loo, C. K. (2016). Transcranial direct current stimulation for acute major depressive episodes: Meta-analysis of individual patient data. *British Journal of Psychiatry the Journal of Mental Science, 208*(6), 522−531

Brunyé, T. T., Cantelon, J., Holmes, A., Taylor, H. A., & Mahoney, C. R. (2014). Mitigating cutaneous sensation differences during tDCS: Comparing sham versus low intensity control conditions. *Brain Stimulation, 7*(6), 832−835

Bush, G., & Shin, L. M. (2006). The Multi-Source Interference Task: An fMRI task that reliably activates the cingulo-frontal-parietal cognitive/attention network. *Nature Protocols, 1*(1), 308−313

Cai, Y., Li, S., Liu, J., Li, D., Feng, Z., Wang, Q., ... Xue, G. (2016). The role of the frontal and parietal cortex in proactive and reactive inhibitory control: A transcranial direct current stimulation study. *Journal of Cognitive Neuroscience, 28*(1), 177−186

Campanella, S., Schroder, E., Monnart, A., Vanderhasselt, M. A., Duprat, R., Rabijns, M., ... Rabijns, C. (2017). Transcranial direct current stimulation over the right frontal inferior cortex decreases neural activity needed to achieve inhibition: A double-blind ERP study in a male population. *Clinical EEG and Neuroscience, 48*(3), 176−188

Castro-Meneses, L. J., Johnson, B. W., & Sowman, P. F. (2016). Vocal response inhibition is enhanced by anodal tDCS over the right prefrontal cortex. *Experimental Brain Research, 234*(1), 185−195

Chambers, C. D., Garavan, H., & Bellgrove, M. A. (2009). Insights into the neural basis of response inhibition from

í

Brammer, M. J., Simmons, A., & Rubia, K. (2014). Shared and drug-specific effects of atomoxetine and methylphenidate on inhibitory brain dysfunction in medication-naive ADHD boys. *Cerebral Cortex, 24*(1), 174−185

Cunillera, T., Brignani, D., Cucurell, D., Fuentemilla, L., & Miniussi, C. (2016). The right inferior frontal cortex in response inhibition: A tDCS-ERP co-registration study. *NeuroImage, 140*, 66−75

Cunillera, T., Fuentemilla, L., Brignani, D., Cucurell, D., & Miniussi, C. (2014). A simultaneous modulation of reactive and proactive inhibition processes by anodal tDCS on the right inferior frontal cortex. *PloS One, 9*(11), e113537

Dambacher, F., Schuhmann, T., Lobbestael, J., Arntz, A., Brugman, S., & Sack, A. T. (2015). No effects of bilateral tDCS over inferior frontal gyrus on response inhibition and aggression. *PloS One, 10*(7), e0132170

Dimoska, A., Johnstone, S. J., Barry, R. J., & Clarke, A. R. (2003). Inhibitory motor control in children with attention-deficit/hyperactivity disorder: Event-related potentials in the stop-signal paradigm. *Biological Psychiatry, 54*(12), 1345−1354

Ditye, T., Jacobson, L., Walsh, V., & Lavidor, M. (2012). Modulating behavioral inhibition by tDCS combined with cognitive training. *Experimental brain research, 219*(3), 363−368

Donkers, F. C. L., & van Boxtel, G. J. M. (2004). The N2 in go/no-go tasks reflects conflict monitoring not response inhibition. *Brain and Cognition, 56*(2), 165−176

Eapen, V., Baker, R., Walter, A., Raghupathy, V., Wehrman, J. J., & Sowman, P. F. (2017). The role of transcranial direct current Stimulation (tDCS) in Tourette syndrome: A review and preliminary findings. *Brain Sciences, 7*(12), 161

Falkenstein, M., Hoormann, J., & Hohnsbein, J. (2002). Inhibition-related ERP components: Variation with modality, age, and time-on-task. *Journal of Psychophysiology, 16*(3), 167−175

Floden, D., & Stuss, D. T. (2006). Inhibitory control is slowed in patients with right superior medial frontal damage. *Journal of Cognitive Neuroscience, 18*(11), 1843−1849

Friese, M., Binder, J., Luechinger, R., Boesiger, P., & Rasch, B. (2013). Suppressing emotions impairs subsequent stroop performance and reduces prefrontal brain activation. *PloS One, 8*(4), e60385

Ganos, C., Kuhn, S., Kahl, U., Schunke, O., Feldheim, J., Gerloff, C., ... Münchau, A. (2014). Action inhibition in Tourette syndrome. *Movement Disorders, 29*(12), 1532−1538

Geusens, B., & Swinnen, N. (2014). *The effect of tDCS on inhibitory control in healthy older adults* (Unpublished Master theses). Universiteit Hasselt Retrieved June 12, 2008, from http://hdl.handle.net/1942/19559

Greenhouse, I., & Wessel, J. R. (2013). EEG signatures associated with stopping are sensitive to preparation. *Psychophysiology, 50*(9), 900−908

Hameed, M. Q., Dhamne, S. C., Gersner, R., Kaye, H. L., Oberman, L. M., Pascual-Leone, A., & Rotenberg, A. (2017). Transcranial magnetic and direct current stimulation in children. *Current Neurology and Neuroscience Reports, 17*(2), 11−25

Herrmann, M. J., Horst, A. K., Löble, S., Moll, M. T., Katzorke, A., & Polak, T. (2017). Relevance of dorsolateral and frontotemporal cortex on the phonemic verbal fluency - A fNIRS-study. *Neuroscience, 367*, 169−177

Hogeveen, J., Grafman, J., Aboseria, M., David, A., Bikson, M., & Hauner, K. K. (2016). Effects of high-definition and conventional tDCS on response inhibition. *Brain Stimulation, 9*(5), 720−729

Hsu, T. Y., Tseng, L. Y., Yu, J. X., Kuo, W. J., Hung, D. L., Tzeng, O. J., ... Juan, C. H. (2011). Modulating inhibitory control with direct current stimulation of the superior medial frontal cortex. *NeuroImage, 56*(4), 2249−2257

Huster, R. J., Enriquez-Geppert, S., Lavallee, C. F., Falkenstein, M., & Herrmann, C. S. (2013). Electroencephalography of response inhibition tasks: Functional networks and cognitive contributions. *International Journal of Psychophysiology, 87*(3), 217−233

Jacobson, L., Ezra, A., Berger, U., & Lavidor, M. (2012). Modulating oscillatory brain activity correlates of behavioral inhibition using transcranial direct current stimulation. *Clinical Neurophysiology, 123*(5), 979−984

Jacobson, L., Javitt, D. C., & Lavidor, M. (2011). Activation of inhibition: Diminishing impulsive behavior by direct current stimulation over the inferior frontal gyrus. *Journal of Cognitive Neuroscience, 23*(11), 3380−3387

Jones, K. T., Gozenman, F., & Berryhill, M. E. (2015). The strategy and motivational influences on the beneficial effect of neurostimulation: A tDCS and fNIRS study. *NeuroImage, 105*, 238−247

Juan, C. H., & Muggleton, N. G. (2012). Brain stimulation and inhibitory control. *Brain Stimulation, 5*(2), 63−69

Kalu, U. G., Sexton, C. E., Loo, C. K., & Ebmeier, K. P. (2012). Transcranial direct current stimulation in the treatment of major depression: A meta-analysis. *Psychological Medicine, 42*(9), 1791−1800

Karuza, E. A., Balewski, Z. Z., Hamilton, R. H., Medaglia, J. D., Tardiff, N., & Thompson-Schill, S. L. (2016). Mapping the parameter space of tDCS and cognitive control via manipulation of current polarity and intensity. *Frontiers in Human Neuroscience, 10*, 665

Knoch, D., Pascual-Leone, A., Meyer, K., Treyer, V., & Fehr,

E. (2006). Diminishing reciprocal fairness by disrupting the right prefrontal cortex. *Science, 314*(5800), 829−832

Kwon, Y. H., & Kwon, J. W. (2013a). Is transcranial direct current stimulation a potential method for improving response inhibition? *Neural Regenration Research, 8*(11), 1048−1054

Kwon, Y. H., & Kwon, J. W. (2013b). Response inhibition induced in the stop-signal task by transcranial direct current stimulation of the pre-supplementary motor area and primary sensoriomotor cortex. *Journal of Physical Therapy Science 25*(9), 1083−1086

van de Laar, M. C., van den Wildenberg, W. P. M., van Boxtel, G. J. M., Huizenga, H. M., & van der Molen, M. W. (2012). Lifespan changes in motor activation and inhibition during choice reactions: A Laplacian ERP study. *Biological Psychology, 89*(2), 323−334

Langenecker, S. A., Bieliauskas, L. A., Rapport, L. J., Zubieta, J. K., Wilde, E. A., & Berent, S. (2005). Face emotion perception and executive functioning deficits in depression. *Journal of Clinical and Experimental Neuropsychology, 27*(3), 320−333

Langenecker, S. A., Kennedy, S. E., Guidotti, L. M., Briceno, E. M., Own, L. S., Hooven, T., ... Zubieta, J. K. (2007). Frontal and limbic activation during inhibitory control predicts treatment response in major depressive disorder. *Biological Psychiatry, 62*(11), 1272−1280

Lansbergen, M. M., Schutter, D. J. L. G., & Kenemans, J. L. (2007). Subjective impulsivity and baseline EEG in relation to stopping performance. *Brain Research, 1148*(1), 161−169

Lapenta, O. M., Sierve, K. D., de Macedo, E. C., Fregni, F., & Boggio, P. S. (2014). Transcranial direct current stimulation modulates ERP-indexed inhibitory control and reduces food consumption. *Appetite, 83*, 42−48

Leite, J., Gonçalves, O. F., Pereira, P., Khadka, N., Bikson, M., Fregni, F., & Carvalho, S. (2018). The differential effects of unihemispheric and bihemispheric tDCS over the inferior frontal gyrus on proactive control. *Neuroscience Research, 130*, 39−46

Li, C. S. R., Huang, C., Constable, R. T., & Sinha, R. (2006). Imaging response inhibition in a stop-signal task: Neural correlates independent of signal monitoring and post-response processing. *Journal of Neuroscience, 26*(1), 186−192

Li, C. S. R., Huang, C., Yan, P., Paliwal, P., Constable, R. T., & Sinha, R. (2008). Neural correlates of post-error slowing during a stop signal task: A functional magnetic resonance imaging study. *Journal of Cognitive Neuroscience, 20*(6), 1021−1029

Liang, W. K., Lo, M. T., Yang, A. C., Peng, C. K., Cheng, S. K., Tseng, P., & Juan, C.H. (2014). Revealing the brain's adaptability and the transcranial direct current stimulation facilitating effect in inhibitory control by multiscale entropy. *NeuroImage, 90*, 218−234

Loftus, A. M., Yalcin, O., Baughman, F. D., Vanman, E. J., & Hagger, M. S. (2015). The impact of transcranial direct current stimulation on inhibitory control in young adults. *Brain and Behavior, 5*(5), e00332

Logan, G. D., & Burkell, J. (1986). Dependence and independence in responding to double stimulation: A comparison of stop, change, and dual-task paradigms. *Journal of Experimental Psychology: Human Perception and Performance, 12*(4), 549−563

Logan, G. D., Schachar, R. J., & Tannock, R. (1997). Impulsivity and inhibitory control. *Psychological Science, 8*(1), 60−64

MacDonald, A. W., 3rd, Cohen, J. D., Stenger, V. A., & Carter, C. S. (2000). Dissociating the role of the dorsolateral prefrontal and anterior cingulate cortex in cognitive control. *Science, 288*(5472), 1835−1838

Mannuzza, S., Klein, R. G., & Moulton, J. L. (2003). Persistence of Attention-Deficit/Hyperactivity Disorder into adulthood: What have we learned from the prospective follow-up studies? *Journal of Attention Disorders, 7*(2), 93−100

Mayberg, H. S. (2007). Defining the neural circuitry of depression: Toward a new nosology with therapeutic implications. *Biological Psychiatry, 61*(6), 729−730

Mcauley, T., Yap, M., Christ, S. E., & White, D. A. (2006). Revisiting inhibitory control across the life span: insights from the ex-Gaussian distribution. *Developmental Neuropsychology, 29*(3), 447−458

McKendrick, R., Parasuraman, R., & Ayaz, H. (2015). Wearable functional near infrared spectroscopy (fNIRS) and transcranial direct current stimulation (tDCS): Expanding vistas for neurocognitive augmentation. *Frontiers in Systems Neuroscience, 9*, 27

Meinzer, M., Lindenberg, R., Darkow, R., Ulm, L., Copland, D., & Flöel, A. (2014). Transcranial direct current stimulation and simultaneous functional magnetic resonance imaging. *Journal of Visualized Experiments*, (86), e51730

Merzagora, A. C., Foffani, G., Panyavin, I., Mordillo-Mateos, L., Aguilar, J., Onaral, B., & Oliviero, O. (2010). Prefrontal hemodynamic changes produced by anodal direct current stimulation. *NeuroImage, 49*(3), 2304−2310

Miniussi, C., Brignani, D., & Pellicciari, M. C. (2012). Combining transcranial electrical stimulation with electroencephalography: A multimodal approach. *Clinical EEG and Neuroscience, 43*(3), 184−191

Morand-Beaulieu, S., Grot, S., Lavoie, J., Leclerc, J. B.,

Luck, D., & Lavoie, M. E. (2017). The puzzling question of inhibitory control in Tourette syndrome: A meta-analysis. *Neuroscience & Biobehavioral Reviews, 80*, 240−262

Mullane, J. C., Corkum, P. V., Klein, R. M., & Mclaughlin, E. (2009). Interference control in children with and without ADHD: A systematic review of Flanker and Simon task performance. *Child Neuropsychology, 15*(4), 321−342

Muszkat, D., Polanczyk, G. V., Dias, T. G., & Brunoni, A. R. (2016). Transcranial direct current stimulation in child and adolescent psychiatry. *Journal of Child and Adolescent Psychopharmacology, 26*(7), 590−597

Nachev, P., Wydell, H., O'Neill, K., Husain, M., & Kennard, C. (2007). The role of the pre-supplementary motor area in the control of action. *NeuroImage, 36*(Suppl. 2), T155−T163

Nejati, V., Salehinejad, M. A., Nitsche, M. A., Najian, A., & Javadi, A. H. (2017). Transcranial direct current stimulation improves executive dysfunctions in ADHD: Implications for inhibitory control, interference control, working memory, and cognitive flexibility. *Journal of Attention Disorders (*4), 1087054717730611

Nieratschker, V., Kiefer, C., Giel, K., Krüger, R., & Plewnia, C. (2015). The COMT Val/Met polymorphism modulates effects of tDCS on response inhibition. *Brain Stimulation, 8*(2), 283−288

Nitsche, M. A., & Paulus, W. (2011). Transcranial direct current stimulation--update 2011. *Restorative Neurology and Neuroscience, 29*(6), 463−492

Nobusako, S., Nishi, Y., Nishi, Y., Shuto, T., Asano, D., Osumi, M., & Morioka, S. (2017). Transcranial direct current stimulation of the temporoparietal junction and inferior frontal cortex improves imitation-inhibition and perspective-taking with no effect on the autism-spectrum quotient score. *Frontiers in Behavioral Neuroscience, 11*, 84

Nozari, N., Woodard, K., & Thompson-Schill, S. L. (2014). Consequences of cathodal stimulation for behavior: when does it help and when does it hurt performance? *PloS One, 9*(1), e84338

Obeso, I., Wilkinson, L., Casabona, E., Bringas, M. L., Álvarez, M., Álvarez, L., ... Marjan, J. (2011). Deficits in inhibitory control and conflict resolution on cognitive and motor tasks in Parkinson's disease. *Experimental Brain Research, 212*(3), 371−384

Oldrati, V., Patricelli, J., Colombo, B., & Antonietti, A. (2016). The role of dorsolateral prefrontal cortex in inhibition mechanism: A study on cognitive reflection test and similar tasks through neuromodulation. *Neuropsychologia, 91*, 499−508

Padmanabhan, A., Garver, K., O'Hearn, K., Nawarawong, N., Liu, R., Minshew, N., ... Luna, B. (2015). Developmental changes in brain function underlying inhibitory control in autism spectrum disorders. *Autism Research, 8*(2), 123−135

Palm, U., Segmiller, F. M., Epple, A. N., Freisleder, F. J., Koutsouleris, N., Schulte-Körne, G., & Padberg, F. (2016). Transcranial direct current stimulation in children and adolescents: A comprehensive review. *Journal of Neural Transmission, 123*(10), 1219−1234

Paulus, W. (2004). Outlasting excitability shifts induced by direct current stimulation of the human brain. *Supplements to Clinical Neurophysiology, 57*(1), 708−714

Peña-Gómez, C., Sala-Lonch, R., Junqué, C., Clemente, I. C., Vidal, D., Bargalló, N., ... Bartrés-Faz, D. (2012). Modulation of large-scale brain networks by transcranial direct current stimulation evidenced by resting-state functional MRI. *Brain Stimulation, 5*(3), 252−263

Peng, C. K., Costa, M., & Goldberger, A. L. (2009). Adaptive data analysis of complex fluctuations in physiologic time series. *Advances in Adaptive Data Analysis, 1*(1), 61−70

Priori, A., Hallett, M., & Rothwell, J. C. (2009). Repetitive transcranial magnetic stimulation or transcranial direct current stimulation? *Brain Stimulation, 2*(4), 241−245

Quinn, C. R., Harris, A., & Kemp, A. H. (2012). The impact of depression heterogeneity on inhibitory control. *Australian and New Zealand Journal of Psychiatry, 46*(4), 374−383

Roberts, A. C., & Wallis, J. D. (2000). Inhibitory control and affective processing in the prefrontal cortex: Neuropsychological studies in the common marmoset. *Cerebral Cortex, 10*(3), 252−262

Rubia, K., Smith, A. B., Brammer, M. J., & Taylor, E. (2003). Right inferior prefrontal cortex mediates response inhibition while mesial prefrontal cortex is responsible for error detection. *NeuroImage, 20*(1), 351−358

Schmitt, L. M., White, S. P., Cook, E. H., Sweeney, J. A., & Mosconi, M. W. (2018). Cognitive mechanisms of inhibitory control deficits in autism spectrum disorder. The *Journal of Child Psychology and Psychiatry, 59*(5), 586−595

Schneider, H. D., & Hopp, J. P. (2011). The use of the Bilingual Aphasia Test for assessment and transcranial direct current stimulation to modulate language acquisition in minimally verbal children with autism. *Clinical Linguistics & Phonetics, 25*(6−7), 640−654

Sehm, B., Kipping, J., Schäfer, A., Villringer, A., & Ragert, P. (2013). A comparison between uni- and bilateral tDCS effects on functional connectivity of the human motor cortex. *Frontiers in Human Neuroscience, 7*, 183

Sehm, B., Schäfer, A., Kipping, J., Margulies, D., Conde, V., Taubert, M., ... Ragert, P. (2012). Dynamic modulation of

intrinsic functional connectivity by transcranial direct current stimulation. *Journal of Neurophysiology, 108*(12), 3253−3263

Shimamura, A. P., Jurica, P. J., Mangels, J. A., Gershberg, F. B., & Knight, R. T. (1995). Susceptibility to memory interference effects following frontal lobe damage: Findings from tests of paired-associate learning. *Journal of Cognitive Neuroscience, 7*(2), 144−152

Shimoni, M., Engel-Yeger, B., & Tirosh, E. (2012). Executive dysfunctions among boys with attention deficit hyperactivity disorder (ADHD): Performance-based test and parents report. *Research in Developmental Disabilities, 33*(3), 858−865

Smith, J. L., Jamadar, S., Provost, A. L., & Michie, P. T. (2013). Motor and non-motor inhibition in the Go/NoGo task: An ERP and fMRI study. *International Journal of Psychophysiology, 87*(3), 244−253

Smith, J. L., Johnstone, S. J., & Barry, R. J. (2008). Movement-related potentials in the Go/NoGo task: The P3 reflects both cognitive and motor inhibition. *Clinical Neurophysiology, 119*(3), 704−714

Soltaninejad, Z., Nejati, V., & Ekhtiari, H. (2015). Effect of anodal and cathodal transcranial direct current stimulation on DLPFC on modulation of inhibitory control in ADHD. *Journal of Attention Disorders, 101*(4), 291−302

Stramaccia, D. F., Penolazzi, B., Sartori, G., Braga, M., Mondini, S., & Galfano, G. (2015). Assessing the effects of tDCS over a delayed response inhibition task by targeting the right inferior frontal gyrus and right dorsolateral prefrontal cortex. *Experimental Brain Research, 233*(8), 2283−2290

Sumner, P., Nachev, P., Morris, P., Peters, A. M., Jackson, S. R., Kennard, C., & Husain, M. (2007). Human medial frontal cortex mediates unconscious inhibition of voluntary action. *Neuron, 54*(5), 697−711

Thakkar, K. N., Polli, F. E., Joseph, R. M., Tuch, D. S., Hadjikhani, N., Barton, J. J. S., & Manoach, D. S. (2008). Response monitoring, repetitive behaviour and anterior cingulate abnormalities in autism spectrum disorders (ASD). *Brain, 131*(9), 2464−2478

van Campen, A. D., Kunert, R., van den Wildenberg, W. P. M., & Ridderinkhof, K. R. (2018). Repetitive transcranial magnetic stimulation over inferior frontal cortex impairs the suppression (but not expression) of action impulses during action conflict. *Psychophysiology, 55*(3), e13003

Vicario, C. M., & Nitsche, M. A. (2013). Non-invasive brain stimulation for the treatment of brain diseases in childhood and adolescence: State of the art, current limits and future challenges. *Frontiers in Systems Neuroscience, 7*, 94

Wessel, J. R., & Aron, A. R. (2015). It's not too late: The onset of the frontocentral P3 indexes successful response inhibition in the stop-signal paradigm. *Psychophysiology, 52*(4), 472−480

Wood, J. N., & Grafman, J. (2003). Human prefrontal cortex: Processing and representational perspectives. *Nature Reviews Neuroscience, 4*(2), 139−147

Woods, A. J., Antal, A., Bikson, M., Boggio, P. S., Brunoni, A. R., Celnik, P., ... Nitsche, M. A. (2016). A technical guide to tDCS, and related non-invasive brain stimulation tools. *Clinical Neurophysiology, 127*(2), 1031−1048

Woods, A. J., Hamilton, R. H., Kranjec, A., Minhaus, P., Bikson, M., Yu, J., & Chatterjee, A. (2014). Space, time, and causality in the human brain. *NeuroImage, 92*(Suppl. C), 285−297

Yasumura, A., Kokubo, N., Yamamoto, H., Yasumura, Y., Nakagawa, E., Kaga, M., ... Inagaki, M. (2014). Neurobehavioral and hemodynamic evaluation of Stroop and reverse Stroop interference in children with attention-deficit/hyperactivity disorder. *Brain & Development, 36*(2), 97−106

Yu, J. X., Tseng, P., Hung, D. L., Wu, S. W., & Juan, C. H. (2015). Brain stimulation improves cognitive control by modulating medial-frontal activity and preSMA-vmPFC functional connectivity. *Human Brain Mapping, 36*(10), 4004−4015

Zandbelt, B. B., Bloemendaal, M., Hoogendam, J. M., Kahn, R. S., & Vink, M. (2013). Transcranial magnetic stimulation and functional mri reveal cortical and subcortical interactions during stop-signal response inhibition. *Journal of Cognitive Neuroscience, 25*(2), 157−174

Zhang, B. W., Xu, J., & Chang, Y. (2016). The effect of aging in inhibitory control of major depressive disorder revealed by event-related potentials. *Frontiers in Human Neuroscience, 10*, 116

Zhang, W. H., & Lu, J. M. (2012). Time course of automatic emotion regulation during a facial Go/Nogo task. *Biological Psychology, 89*(2), 444−449

Zhu, D. C., Zacks, R. T., & Slade, J. M. (2010). Brain activation during interference resolution in young and older adults: An fMRI study. *NeuroImage, 50*(2), 810−817

Zmigrod, S., Colzato, L. S., & Hommel, B. (2014). Evidence for a role of the right dorsolateral prefrontal cortex in controlling stimulus-response integration: A transcranial direct current stimulation (tDCS) study. *Brain Stimulation, 7*(4), 516−520

Effects of transcranial direct current stimulation (tDCS) on the frontal lobe region on inhibitory control

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Abstract: Inhibitory control is an important part of executive function. Studies have showed that inhibitory control is in connection with activities in the frontal lobe region. Transcranial direct current stimulation (tDCS) is a kind of non-invasive brain stimulation that can regulate activation intensity of the brain region. Studies have shown that tDCS on partial region of the frontal lobe can effectively interfere with the level of inhibitory control of the participants, and this intervention can be affected by changes in such conditions as location and type of the stimulation, and experimental tasks. At present, tDCS has been applied to the studies on inhibitory control of different populations, and can be better combined with other research techniques.

Key words: inhibitory control; response inhibition; tDCS; IFG; dlPFC; pre-SMA