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„Can Non-Invasive Brain Stimulation Really Alter Visual  
Art Making? – Exploring the Roles of Frontotemporal  
Brain Regions in Creative and Realistic Drawing“

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### Abstract

Over the past two decades, frontotemporal dementia (FTD) was linked to the spontaneous development of enhanced artistic abilities, often involving realistic drawing skills. These reports have sparked scientific interest in whether artificially altering the functionality of frontotemporal brain regions (FTRs) can make artistic abilities also accessible to healthy individuals. To date, only few studies have explored this idea by using non-invasive brain stimulation, providing intriguing but limited—due to a lack of standardized art making and assessing procedures—causal evidence, where changed artistic abilities have been reported in single individuals only. Therefore, the scarce causal evidence on whether non-invasive brain stimulation can really alter visual art making remains inconclusive. The present thesis aimed to address this research gap by conducting an experiment where a recently introduced art making and assessing paradigm was combined with either left or right unilateral anodal transcranial direct current stimulation (tDCS) of healthy participants' FTRs. In an exploratory approach, the relation between self-assessed artistic abilities, personality and recognizing out-of-focus pictures and actual visual art making abilities was explored. Overall, results showed no effects of tDCS on visual art making, but increased stereotypicality of internally cued realistic drawings after tDCS of left FTRs. Also, veracity analyses for the employed art making paradigm showed an overall robust ability to measure artistic abilities of artists. Exploratory results only partially replicated previous findings but showed that even within a homogenous sample, interindividual differences can influence the effects of tDCS. Limitations and directions for future research are discussed.

**Keywords:** artistic creativity, visual art making, FTD, tDCS, non-invasive brain stimulation

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Art making is a unique human activity, practiced for at least 40,000 years, and is closely linked to the development of higher cognitive functions such as symbolic thought and communicative systems (Zaidel, 2010; Zaidel et al., 2013). Visual art making thereby represents one of the most complex human activities involving various abilities such as perception, memory, motor control, imagination, or creativity (Pelowski et al., 2017). While most people have engaged in visual art making at some point, the ability to produce art, that is aesthetically pleasing and/or is original, is rather scarce (Pelowski et al., 2019). This is illustrated by research showing that most people, even art students, cannot draw what they see—arguably a core skill of visual artists (Chamberlain & Wagemans, 2016; Cohen & Bennett, 1997; McManus et al., 2010).

Interestingly, there is evidence that single individuals have developed enhanced artistic abilities after suffering from brain damage and/or cognitive impairment, sparking interest to explore the neurophysiological foundations of visual art making and artistic abilities by studying such patients (e.g., Chatterjee et al., 2011; Gretton & Ffytche, 2014; Lauring et al., 2019; Pelowski et al., 2022; Viskontas & Miller, 2013; Zaidel, 2014). Especially frontotemporal dementia (FTD)—a progressive neurodegenerative disease, which primarily affects frontal and temporal lobes—thereby has often been associated with emergent artistic behavior, improved art quality and creativity, and often enhanced realistic drawing skills (Friedberg et al., 2022; Geser et al., 2021; Gretton & Ffytche, 2014; Pelowski et al., 2022). It therefore was hypothesized that replicating brain damage observed in such artistic FTD patients via artificially altering neuronal functionality of frontotemporal regions (FTRs) via non-invasive brain stimulation (NIBS) could potentially also make (enhanced) artistic abilities accessible to healthy individuals (Snyder, 2009). To date, few studies have addressed this idea by using NIBS, overall suggesting a causal relation between altered FTR functionality and altered visual artistic abilities (VAAs), such as (realistic) drawing skills, or

figural creativity (Milano et al., 2016; Simis et al., 2014; Snyder et al., 2003; R. L. Young et al., 2004). However, due to a lack of comprehensive, systematic, and standardized art making and assessing procedures, or generally low sample sizes, these findings are considerably limited, overall leaving unanswered the question whether and how non-invasive brain stimulation of FTRs really can alter visual artistic abilities.

The present thesis aims to address this research gap by combining a recently introduced comprehensive and standardized art making and assessing paradigm (Pelowski et al., 2019) with an increasingly used NIBS method, namely transcranial direct current stimulation (tDCS). Therefore, literature regarding the phenomenon of emergent artistic abilities in FTD patients will be reviewed, including relevant theories and concepts that may be able to explain as to how brain damage and altered brain functionality of FTD patients can lead to altered VAAs. This is followed by a discussion of literature regarding NIBS and previous research results, linking altered functionality of FTRs to creativity and visual artistic abilities. Finally, an experiment is outlined that aims to provide a first comprehensive insight into the roles of FTRs in visual art making and artistic abilities, and to answer the question whether non-invasive brain stimulation can indeed alter visual art making abilities.

### **Art making and the dysfunctional brain**

The ability to produce high-quality art that is aesthetically pleasing and/or shows originality is scarce, as is basic research into the nature and contributing factors of such abilities (Pelowski et al., 2019). Only within the past two decades systematic efforts started to study art making empirically, where e.g., a substantial body of research addressed the relation between visuospatial abilities and realistic drawing skills, or steps and techniques employed by trained artists (Chamberlain & Wagemans, 2016; Kozbelt & Seeley, 2007; Pelowski et al., 2019 for review). A promising line of research to understand the neurophysiological basis of VAAs is to study people who have spontaneously developed (enhanced) artistic abilities

following brain damage (e.g., Chatterjee et al., 2011; Geser et al., 2021; Gretton & Ffytche, 2014; Midorikawa et al., 2008; Miller et al., 1996; Pelowski et al., 2022; Seeley et al., 2008; Selfe, 2011; Treffert, 2014; Zaidel, 2014). The phenomenon of emergent artistic behavior has been observed in various forms of brain damage and it has been argued that it may represent a high survival motivation to communicate through art making, often in conjunction with loss of verbal communication skills (Zaidel, 2014).

### ***Neurodegenerative diseases and artistic abilities***

Over the past two decades a growing body of research increasingly has addressed emergent and altered artistic behavior and abilities in context of progressing neurodegenerative diseases such as dementia, or Parkinson's Disease (PD). Several reviews of case reports and art produced suggested that diseases could affect art making in a distinct way, likely to reflect specific changes in the brain (e.g., Gretton & Ffytche, 2014; Pelowski et al., 2022). For example, Alzheimer's Disease was associated with increased abstraction and simplification, or decreased quality of art, probably due to visuospatial impairment related to damage in parietal lobes and inferior temporal lobes (Fornazzari, 2005; Maurer & Prvulovic, 2004; for reviews Gretton & Ffytche, 2014; Pelowski et al., 2022); PD was associated with de novo emergent artistic creativity, possibly related to dopamine-elevating antiparkinsonian treatment, and reduced functionality of dorsolateral prefrontal cortices (dlPFC) and lateral orbitofrontal cortices (OFC; Luring et al., 2019). Reported qualitative changes in context of PD were mixed, where some authors suggested increased (Chatterjee et al., 2006; Kulisevsky et al., 2009), or decreased quality and creativity (Drago et al., 2009; Shimura et al., 2012).

### ***Artistic abilities in FTD***

FTD may play a unique role in this context with many cases showing emergent artistic productivity and overall improvement in artistic abilities, with some FTD patients even being attributed with artistic excellence, often including enhanced realistic drawing

skills (Miller et al., 1996; Seeley et al., 2008; for reviews Geser et al., 2021; Gretton & Ffytche, 2014; Pelowski et al., 2022). An overview of reported cases can be found in Table A1. To better describe and understand the nature of emergent artistic abilities in FTD, different aspects will be discussed separately namely: productivity, creativity, and quality.

**Productivity.** Artistic FTD patients showed a sudden (re)emergence of artistic interest and productivity with a median lag of two years after disease onset, or with a median of eight years before first symptoms (Geser et al., 2021). While emergent artistic productivity also was observed in other domains such as music or writing, most patients started to produce art in the visual domain such as drawing, painting, or sculpturing, probably reflecting spared or even altered visuospatial abilities/behavior e.g., allocation of visual attention (H. A. C. Green & Patterson, 2009; Miller et al., 1996; Seeley et al., 2008; Viskontas et al., 2011, Geser et al., 2021 for review). The process of art making thereby often was described as compulsive and/or disinhibited, featuring repetitive themes, pattern, or motifs, typically depicting concrete objects or scenes in a realistic style (de Souza et al., 2014; Gretton & Ffytche, 2014; Miller et al., 1998; Pelowski et al., 2022; Seeley et al., 2008). It was argued that characteristics such compulsive focus on a single art medium, repetitive themes, and aiming for perfection, may provide the foundation for developing enhanced artistic abilities (Schott, 2012). However, some patients only produced drawings after they were encouraged to do so, but otherwise showed similar artistic abilities such as interest in realistic motifs and realistic drawing skills (Midorikawa et al., 2008)

**Quality and Creativity.** Art by FTD patients mostly was described showing increased creativity and/or quality (Drago et al., 2006; Erkkinen et al., 2018; Liu et al., 2009; Miller et al., 1996, 1998; Seeley et al., 2008; Thomas Antérion et al., 2002; for reviews Pelowski et al., 2022; Gretton & Ffytche, 2014). Also, increased creativity but decreased quality (Kearney et al., 2012) or emergent realistic painting ability without

creativity/originality was reported (Midorikawa et al., 2008). Enhanced quality thereby often was associated with increased realism of naturalistic and/or floral motifs, and typically was reported in patients with dominant left hemispheric damage (e.g., Midorikawa et al., 2008; Seeley et al., 2008). Interestingly, decreased realism (i.e., increased abstraction) was reported in patients with dominant right hemispheric damage, possibly suggesting hemispheric differences of FTRs' involvement in visual art making (Mendez, 2004; Mendez & Perryman, 2003).

The role of creativity has been critically discussed, with some authors suggesting that enhanced creativity may represent pseudo-creativity (de Souza et al., 2010, 2014), or suggesting a communicative, rather than an artistic nature of artistic behavior (Midorikawa et al., 2008). In contrast, other authors suggested that intensified and unfiltered (visual) experiences, likely involving memories, or even forms of multimodal/synesthetic experiences may indeed have facilitated enhanced creativity (Miller et al., 1996; Seeley et al., 2008).

### ***Neuropathology of (artistic) FTD***

Typically, three main types of FTD are differentiated, namely a behavioral variant (bvFTD), where behavioral changes such as disinhibition or compulsions represent the dominant clinical manifestation (Gorno-Tempini et al., 2004; Riedl et al., 2014), and two language variants (primary progressive aphasia: PPA), where a semantic variant (svPPA; often referred as semantic dementia), is associated with the loss of semantic knowledge; and a non-fluent variant (nfvPPA) is associated with effortful speech production (Gorno-Tempini et al., 2011; Suárez-González et al., 2021). Each subtype thereby can be linked to a specific pattern of brain damage, where typically dominant frontal damage is associated with bvFTD, whereas more (left) lateralized damage in anterior temporal lobes, or orbitofrontal regions is associated with PPA (for more detailed descriptions of each subvariants' characteristics see Appendix; Gorno-Tempini et al., 2011; Olney et al., 2017; Peet et al., 2021 for review).

An overview of reported brain changes/damage in artistic FTD patients can be found in Table A1, which shows that most cases showed atrophy and/or reduced perfusion (hypoperfusion) predominantly in the temporal lobes, and in about half of the cases, also frontal regions were also involved or predominantly affected. While often both hemispheres were affected, most patients showed predominant left hemispheric damage or hypoperfusion (see Table A1). This led to the rationale that left (anterior) temporal and selective orbital/inferior frontal regions may play important roles in altered VAAs in FTD (Liu et al., 2009; Rankin et al., 2007; for review Friedberg et al., 2022; Geser et al., 2021; Pelowski et al., 2022). Interestingly, two studies reported increased perfusion and/or higher grey matter density in right posterior regions suggesting potentially compensatory effects due to brain damage (Miller et al., 1996; Seeley et al., 2008).

### ***Paradoxical functional facilitation in artistic FTD***

The reported increased perfusion in right posterior brain regions led to the common rationale that enhanced artistic abilities may represent a form of paradoxical functional facilitation (PFF, Kapur 1996; but see A. Liu et al., 2009; Miller et al., 1996, 2000; Seeley et al., 2008). PFF thereby describes a phenomenon where individuals with nervous system pathology eventually perform better in certain tasks, possibly via unmasking of latent anatomical connections, reduced competition between cortical areas, decreased inhibitory control, and/or gain of functionality due to compensatory mechanisms (e.g., neuroplasticity; Kapur, 1996). In context of artistic FTD, it was hypothesized that reduced inhibitory control due to damage in left FTRs could lead to altered/increased functionality in other brain regions, possibly facilitating access to ideas, altered visual experiences, or elevated sensory awareness (Mendez, 2004; Miller et al., 1996, 1998; Seeley et al., 2008; for review Pelowski et al., 2022).

**PFF via changed functional connectivity of large brain networks?** A promising avenue to research, yet poorly understood, PFF in this context, is studying how the brain, on a large scale, functionally adapts to progressing brain damage (Viskontas & Miller, 2013). Interestingly, diseases such as FTD indeed seem to progress along existing communication paths and within large-scale brain networks (LSBNs) and hence could allow to better understand both VAAs and functionality of LSBNs (Mandelli et al., 2016; Seeley, 2017; Seeley et al., 2009; Viskontas & Miller, 2013). Typically, LSBNs are determined based on functional connectivity (FC) analyses, which is the estimation of statistical relations based on neurophysiological measures of different brain regions (e.g., temporal correlation of resting-state functional magnetic resonance imaging, fMRI). FC between regions thereby is assumed to indicate a shared involvement in cognitive functions, and therefore possibly representing a functional network (Ferreira et al., 2022; Friston, 2011; Friston et al., 1993; Yeo et al., 2011).

An interesting role thereby could be played by the anterior temporal lobes (ATLs), as representing a characteristic site of degeneration in artistic FTD patients (Table A1, but see Peet et al., 2021) and being involved in several networks, supporting different cognitive functions such as high-level visual processing, socio-affective behavior, semantic and conceptual processing, semantic memory, or language (Binney et al., 2012; Pascual et al., 2015; Persichetti et al., 2021; Yeo et al., 2011). A LSBN of particular interest thereby is the default network (DN, or medial frontoparietal network, see Uddin et al., 2019), which aside from its core regions (medial PFC, posterior cingulate cortex, inferior parietal lobule; IPL) is associated with FTRs such as the inferior frontal gyrus (IFG), middle temporal gyrus (MTG), or orbitofrontal regions (Uddin et al., 2019). The DN typically is associated with intrinsic processes such as generation of thought or memory retrieval, but also detecting relevance of internal, and external stimuli, or goal-dependent associative processing (Buckner et al., 2008; Spreng et al., 2013; Uddin et al., 2019).

A recent study has shown that svPPA-patients with lesioned ATLs do indeed show functionally reorganized LSBNs, such as decreased FC within the DN, and increased FC between a visual association network (VAN), extending along the ventral temporal lobe, and the dorsal attention network (DAN), which is not associated to FTRs (Popal et al., 2020). The authors interpreted these findings as consistent with their hypothesis, that a degeneration of FTRs could lead to a release of inhibitory control of the DN over the DAN, possibly leading to ‘attentional capture by perceptually distinctive features of the visual environment regardless of their conceptual meaning’, and thus possibly could explain altered visual and/or artistic behavior in FTD patients (Popal et al., 2020, p. 2). This could also be consistent with research showing that greater activation of the DAN facilitated local processing i.e., focusing on details rather than holistic features of an external stimulus (Leaver et al., 2015), which in turn could facilitate the ability to draw from observation (Chamberlain et al., 2013) and generally with observed increased perfusion and/or gray matter density in right posterior regions in artistic FTD patients (Miller et al., 1996; Seeley et al., 2008; see also Friedberg et al., 2022).

Interestingly, research has also shown that the DN and FTRs play a central role in creativity, where an increased FC between the DN, associated with generation of ideas, and the executive control network (ECN)—associated with cognitive control and evaluative processes—was positively related to creativity (Beaty et al., 2014, 2016, 2019; Ellamil et al., 2012; Gao et al., 2017; Z. Liu et al., 2018; Lloyd-Cox et al., 2022; Zhu et al., 2017). It was found that figural creativity was positively associated with increased FC between the ECN, attention and memory-retrieval networks, but decreased FC between the DN, ventral attention network, and primary sensory networks (Z. Liu et al., 2018). Interestingly, these findings seem consistent with the above-described FC in svPPA patients, as both studies reported

decreased FC involving the DN, but increased FC of attention and/or visual association networks.

### **Non-invasive brain stimulation, creativity, and visual artistic abilities**

Additional support for the involvement of FTRs in artistic abilities comes from research with non-invasive brain stimulation (NIBS), showing that artificially altered functionality of FTRs affected performance on various creativity tasks (Chi & Snyder, 2011; Chrysikou et al., 2021; Hertenstein et al., 2019; Ivancovsky et al., 2019; Kenett et al., 2021; Khalil et al., 2020; Li et al., 2023; Lucchiari et al., 2018; Mayseless & Shamay-Tsoory, 2015; Ruggiero et al., 2018; Weinberger et al., 2017), and possibly also VAAs, such as realistic drawing or figural creativity (Milano et al., 2016; Simis et al., 2014; Snyder et al., 2003; Young et al., 2004).

### ***NIBS***

In this context, the two most frequently used methods were transcranial magnetic stimulation (TMS) and tDCS. TMS works on the principle of electromagnetism, where strong electromagnetic pulses, emitted via a hand-held coil, can elicit temporarily-restricted bursts of action potentials underneath targeted regions; repetitive protocols (rTMS) can result in several minute-lasting neuromodulatory after-effects, which, depending on parameters (e.g., frequency), can either result in inhibitory (low frequency, 0.2–1 Hz) or excitatory effects (high frequency,  $\geq 5$  Hz; Hallett, 2007; Klomjai et al., 2015; Polanía et al., 2018 for review).

tDCS applies electrical current via two electrodes (anodal, cathodal) directly on the scalp and can lead to the de- or hyperpolarization of neuronal resting membrane potential which modulates rather than stimulates spontaneous neuronal activity i.e., the likelihood of a neuron eliciting an action potential in areas approximately underneath the electrodes (Fritsch et al., 2010; Nitsche et al., 2008; Stagg & Nitsche, 2011). While anodal stimulation typically

is associated with an increase in neuronal excitability and cathodal stimulation with a decrease in neuronal excitability, there is growing evidence that tDCS effects may not be linear, i.e., that an increase of intensity and/or duration does not necessarily result in an increase of effects, or even can result in reversed effects (Batsikadze et al., 2013; Mosayebi-Samani et al., 2020; Mosayebi Samani et al., 2019; Weller et al., 2020).

For example, 20 minutes of cathodal stimulation with 2 mA over the motor cortex was found to have excitatory rather than inhibitory effects (Batsikadze et al., 2013; Mosayebi-Samani et al., 2020; Mosayebi Samani et al., 2019); anodal stimulation of the PFC only with 1 mA compared to 2 mA resulted in performance gains in a cognitive control training paradigm (Weller et al., 2020). However, the non-linearity of tDCS effects is still poorly understood, including its transferability towards other cortical regions (Mosayebi-Samani et al., 2023; for research indicating transferability see Nissim, O'Shea, Indahlastari, Kraft, et al., 2019; Nissim, O'Shea, Indahlastari, Telles, et al., 2019; Soleimani et al., 2021).

### ***Can NIBS alter artistic abilities?***

The rationale of most studies aiming to alter creativity or artistic abilities has been to modulate the inhibitory control that FTRs likely exert over other cortical regions and/or LSBNs (Li et al., 2022). On one hand, reduced inhibition could potentially facilitate idea generation, access to low-level unfiltered perceptual information, and/or reduce the tendency to follow mental routines (i.e., allowing to think 'outside-the-box'). On the other hand, increased inhibition could facilitate the suppression of common, i.e., non-creative ideas, the selection of novel ideas, or the general enhancement of evaluative/control processes (Li et al., 2022; Lucchiari et al., 2018; Weinberger et al., 2017 for reviews).

**tDCS and creativity.** A substantial body of research showed that creativity can be altered by targeting FTRs with tDCS, e.g., a bilateral montage (left cathodal, right anodal i.e.,

L–R+; 1.6 mA, 17 min) targeting ATLs (F7–FT7/F8–FT8 on 10/20 electrode system, associated with storing mental templates) facilitated problem-solving by insight (Chi & Snyder, 2011, 2012; however, subsequent research produced mixed findings, see Lucchiari et al., 2018), a unilateral montage (L–, 1.5 mA, 20 min) targeting the PFC (F7/F8; associated with filtering bottom-up information, see Thompson-Schill et al., 2005) facilitated cognitive flexibility (Chrysikou et al., 2013, 2021) or a bilateral montage (L–R+, 1–1.5 mA, 22 min) targeting the IFG (crossing point T4/T3–Fz and F8/F7–Cz; associated with controlled semantic memory retrieval, Grindrod et al., 2008) enhanced creative fluency (Hertenstein et al., 2019; Maysless & Shamay-Tsoory, 2015).

It was suggested that a creativity-facilitating cognitive state could depend on the balance between IFG activity and the DN, where a relative dominance of an ‘IFG system’ (IFG and temporal pole) represents a routine-based, economic state of the cognitive system, with short-range semantic connectivity (see A. E. Green et al., 2010), whereas dominance of the DN could represent a ‘creative-on’ state facilitating long-range connectivity allowing more flexible thinking (Lucchiari et al., 2018, p. 8). Note that this may not be consistent with observed decreased FC of the DN in people with enhanced figural creativity (Z. Liu et al., 2018, see above).

**NIBS and visual art making.** In contrast to the rather robust evidence showing that NIBS of FTRs can alter creativity—but mostly based on verbal tasks, the evidence regarding altered visual artistic abilities is limited and scarce; an overview of studies and used NIBS can be found in Table 1. For example, while sample sizes overall were quite low (< 20; total N=48, see Table 1), one study only included male participants (Snyder et al., 2003) and where another study only included one participant (i.e., representing a case study) who showed emergent de novo artistic interest after a left hemispheric stroke four years prior to the experiment (Simis et al., 2014). Also, one study was published only in abstract form and

involved a between-subject design, which is not capable of attenuating for potential interindividual differences of tDCS effects (Milano et al., 2016; but see Bertossi et al., 2017; Li et al., 2022).

However, one reason for the scarcity of research on visual art making is likely to be the lack of well-established and standardized art making and assessing procedures, as can be seen from Table 2, showing that each study used a different art making and assessing procedure (see also Pelowski et al., 2017, 2019). Two studies focused on realistic drawing abilities, where participants had to freely draw a horse or dog and reproduce an image of female face from memory (Snyder et al., 2003), or copy a drawing of a horse from sight (Young et al., 2004). In contrast, the study of Milano et al. (2016) used a highly standardized figural creativity test that included only figural completion tasks (Abbreviated Torrance Tests for Adults, Goff & Torrance, 2002). Only one study included both, realistic and creative drawing tasks, where participants had to freely draw a horse, a house, and a drawing of their choice (Simis et al., 2014). Interestingly, most realistic drawing tasks used, included the drawing of a horse, which was argued as being due to artistic savants previously having shown particular interest in horses or hooved animals (Young et al., 2004, but see Selfe, 1977).

However, while art making tasks may reasonably vary according to a particular research focus, the lack of standardization, transparency, and clarity in the assessment of art products represents an even greater limitation to existing evidence. For example, art products were assessed using two unspecified ‘committees’, where the first committee ranked artworks for ‘best art’ (not reaching consensus), and where then a second committee was told to judge artwork-sets on ‘demonstrable change of scheme or convention’ (Snyder et al., 2003, p. 3). Another study rated art products for their accuracy, based on unreported criteria adapted from the Good-Enough Harris Drawing Test (Harris, 1965), and also for their ‘artistic merit’ by

three local artists who ranked drawings from ‘least to most artistic’, and assigned them ‘a mark out of 20 for their artistic impression’ (Young et al., 2004, p. 216). Also, art products were assessed by authors’ post-doctoral colleagues (Simis et al., 2014).

**Table 1***Experimental design of visual art making studies featuring NIBS*

Reference	tDCS		Location Electrodes		Design/Polarity	N
	Protocol	Parameters	Target	Reference		
<b>Simis et al. (2014)</b>	Unilateral, online	2 mA, 20 min	F8	Fronto-temporal-parietal (10 x 10 cm)	Case-study; 3 sessions of 10 min ‘baseline sham’ each followed by 10 min RFT+; RFT–; or sham	1
<b>Milano et al. (2016)</b>	Unilateral, offline	2 mA, 10 min	dIPFC; ATL		Between-subject; left dIPFC+ & ATL– vs. right dIPFC+ & ATL–	19
rTMS						
	Protocol	Parameters	ROI	Control	Design	N
<b>Snyder et al. (2003)</b>	Unilateral; Online & offline	90%MT; 0.5 Hz; 15 min	F7-T7	10%MT; 0.5 HZ; 15 min None None	Random, single-blind crossover	8  1 2
<b>Young et al. (2004)</b>	Unilateral; Online	33-55%MT; 0.9Hz; 9 min	F7–T7	left MC (33–50%MT); no stimulation	Within-subject; IFTR vs. IMC vs. sham	17

*Note.* tDCS for transcranial direct current stimulation; Target/ROI refers to the 10-20 electrode placement system (Jasper, 1958); rTMS for repetitive transcranial magnetic stimulation; ROI for region of interest; + indicates anodal stimulation; – indicates cathodal stimulation; ‘MT’ represents resting motor threshold, e.g., see Borckardt et al. (2006).

**Table 2***Overview of art making and assessing paradigms in studies featuring NIBS*

Drawing Task / Time	Assessment			Finding	Limitations
	Scales/Method/Analyses	Rater	N		
<b>Simis et al. (2014)</b> drawing of a horse, a house, and a free drawing; 2.5 min per drawing	Creativity, Perspective, Aesthetics, Realism, Accuracy; Kruskal-Wallis Test	Post-Docs	11	Improvement only after anodal tDCS for Creativity, Perspective, Realism, and Accuracy.	Single participant with left hemispheric brain damage; post-doc raters;
<b>Milano et al. (2016)</b> ATTA; 2 incomplete figures; 9 figural complementation (triangles); naming of drawings; 3 min per task	fluency; originality; elaboration; flexibility; Scoring Procedure ATTA; NA	NA	NA	Figural originality was decreased after left hemispheric stimulation	Only reported as poster; between-subject; small sample size; no realistic drawing task
<b>Snyder et al. (2003)</b>					

Drawing of a dog and a horse; reproducing an image of a female face (30s presentation time before drawing); 1 min per drawing	Two committees: Com. 1: consensus regarding 'best artworks'; Com. 2: notable changes within series of artworks per participant regarding scheme and convention; qualitative	NA	NA	no systematic improvement in naturalistic drawing ability; notable changes in convention and scheme observed in single participants (only 2 also underwent sham; 1 received rTMS at 1Hz)	Rating process not transparent and clear; no creative drawing task; only male participants; small sample size
<b>Young et al. (2004)</b>					
Replicating a drawing of a horse; NA	1) adapted Good-Enough Harris Drawing Test criteria (1963) for accuracy—not stated; 2) artist-raters ranked horses from least to most artistic; and rated horses for artistic impression for artistic merit; ANOVA	NA & artists	NA/ 3 artists	No effects; one participant showed 'striking' improvement after rTMS	No creative drawing task; small sample size

*Note.* ATTA for Abbreviated Torrance Tests for Adults (Goff & Torrance, 2002); NA for information not available; rTMS for repetitive transcranial magnetic stimulation; ANOVA for Analysis of Variance.

A summary of the findings of the studies discussed above can be found in Table 2, which shows that inhibition of left FTRs (via rTMS) could not systematically alter realistic drawing abilities, but may have led to stylistic changes in individual subjects (5/28; Snyder et al., 2003; R. L. Young et al., 2004). In contrast, the results of both tDCS studies did indeed indicate altered artistic abilities, with unilateral anodal tDCS (2 mA, 20 min, compared to cathodal and sham) of right FTRs in a patient with prior left hemispheric brain damage resulting in higher ratings of creativity, perspective, realism, or accuracy (Simis et al., 2014), and cathodal tDCS of left FTRs with ipsilateral anodal tDCS of dlPFC resulting in decreased figural originality (2 mA, 10 min; Milano et al., 2016).

These findings suggest that a reduction of neuronal functionality of left FTRs alone may be a necessary, but not sufficient condition to effectively alter (realistic) drawing abilities, whereas a functional loss within the left hemisphere, in conjunction with an increase of neuronal excitability in left frontal regions resulted in reduced figural creativity, or in conjunction with increased neuronal excitability of right FTRs in enhanced visual artistic abilities, and creativity. However, due to significant limitations in the used art making and assessing procedures used, this causal evidence is overall weak and/or

inconclusive, leaving unanswered the question of how FTRs are involved in visual art making, and whether non-invasive brain stimulation can really alter visual art making.

### **The present thesis**

To address this research gap, the present thesis aims to provide a first comprehensive and systematic insight into how frontotemporal regions may contribute to visual art making. To achieve this, a within-subject experiment was employed in which healthy, non-artistic individuals received unilateral anodal tDCS over FTRs (either left or right) and completed a comprehensive set of visual art making tasks. The choice of using a unilateral tDCS montage was aiming to obtain a better understanding of possible hemispheric-specific roles of FTRs in visual art making, and also as such montage has previously been associated with altered visual artistic abilities (Simis et al., 2014). The potential increase of neuronal excitability therefore was aiming to mimic possible PFF effects observed in artistic FTD patients such as those observed in svPPA patients (Popal et al., 2020).

To obtain a differentiated and comprehensive insight into the roles of FTRs in visual art making, a recently introduced art making and assessing paradigm was employed and slightly adapted (Pelowski et al., 2019). This included a creative, free drawing task starting from given cues and two realistic drawing tasks, which differ in the source of the cue (internally vs. externally). Art products were assessed by professional visual artists using a comprehensive and clear set of scales including aesthetic quality, creativity, technical drawing skill, realism, and personal liking. In addition, the veracity of the employed paradigm was assessed following analyses employed by Pelowski et al. (2019), allowing to explore the nature and quality of the obtained dataset.

In an exploratory approach, the previously reported positive relations between self-assessed artistic abilities (Chamberlain et al., 2021; Kozbelt, 2001), personality (Beaty et al.,

2018; Silvia et al., 2009), and performance in an out-of-focus picture task (see Kozbelt, 2001) regarding actual art making abilities were replicated. This also addressed the question of whether tDCS might affect these measures and their relation to actual art making ability.

In awareness of existing limitations of existing evidence in this field, it was hypothesized that following anodal tDCS of right FTRs, participants' art would possibly receive higher ratings of quality, creativity, and/or realism—in line with findings from Simis et al. (2014); a reversed trend was hypothesized following anodal tDCS of left FTRs, possibly most pronounced for creativity in line with previous findings (Milano et al., 2016; also see Ivancovsky et al., 2019; Kenett et al., 2021). However, this study is considered to be exploratory, with weak or no a priori expectations, and the intention to contribute to art making research by applying a comprehensive and standardized experimental art making and assessing paradigm combined with brain stimulation, addressing existing limitations of previous research.

## **Method**

### **Part I: Brain stimulation and visual art making**

#### ***Participants (Artists)***

Sixty participants (44 females, 16 males) with a mean age of 20.8 years ( $SD = 2.2$ ; range: 18–28 years) were recruited using the recruitment system of the faculty of psychology of the University of Vienna and received course credit for participation. Apart from two individuals (employees), all participants were students and had no higher education in art history or applied arts. All were right-handed, had normal or corrected-to-normal vision and no other visual limitation, reported no history of neurological disease, no history of epilepsy including parents and siblings, no current medical disease including skin diseases or allergies, no usage of psychoactive medication, did not consume alcohol or other psychotropic

substances the night before the experiment, were not pregnant and had no metal parts in the body (except dental fillings). The experiment was approved by the ethics committee of the University of Vienna.

The first 30 participants were assigned to the ‘left frontotemporal group’ in the following referred to as ‘LFT’ receiving tDCS over left FTRs (18 females, 12 males; mean age: 21.24 years;  $SD = 2.5$ ; range: 18–28 years), while 30 following participants were assigned to the ‘right frontotemporal group’, in the following referred to as ‘RFT’ receiving tDCS over right FTRs (26 females, 4 males; mean age: 20.43 years;  $SD = 1.9$ ; age range: 18–26 years). In the following, these participants will be also referred to as ‘artists’.

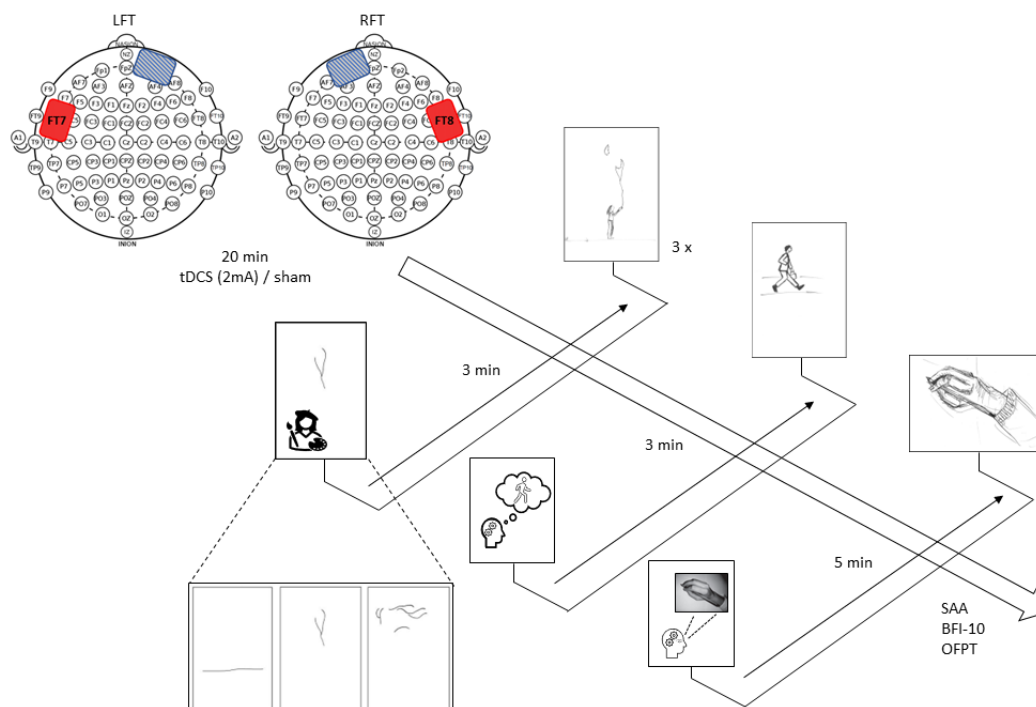
### ***Procedure***

Data was collected between November 2016 and February 2020 in the laboratories of the faculty of psychology of the University of Vienna. Participants underwent the experiment on an individual basis, under calm and steady conditions. Upon arrival, participants had to read and sign a form to participate in the experiment including a detailed explanation of the experimental procedure and tDCS, a medical-history questionnaire, and a consent form. For the sake of the experiment, participants were only deceived in terms of the sham stimulation. After signing the form and before the start of the experiment, participants were asked whether aspects of the experiment remained unclear to them and if so, these were addressed. It was emphasized that participants should immediately report unpleasant feelings of any kind during the stimulation (e.g., dizziness) and that it was possible to abort the experiment at any time without consequences (e.g., losing course credit). During the stimulation, participants saw an episode of ‘Goof Troop’ (S1E43 and/or S1E52) to draw attention away from the stimulation.

After the stimulation, drawing tasks were started immediately; the experimental design can be found in Figure 1. With the consent of participants, the process of drawing was video recorded—only hands, pen, and paper were visible—to help clarify rotation of drawings in case of uncertainty. The drawing tasks were followed by a block of measures including self-assessed artistic abilities (SAA) and personality, and a perception task (see Exploratory Approach below). At the end of the second session, participants completed additional measures that were not included in the current analyses as not fitting the scope of the present thesis and to maintain the conciseness of the manuscript; a list of these measures can be found in Table A2. After finishing all tasks, participants were debriefed about the aim and rationale about the present study and about the deception regarding the sham-stimulation. In the following, each part is described in more detail below.

**Figure 1**

*Experimental Design*



*Note.* Electrode placement: red (solid fill) rectangles represent anodal electrodes which were placed over midpoint between F7 & T7 or approximately FT7 (LFT) and F8 & T8 or approximately FT8 (RFT); blue (striped) rectangles represent cathodal electrodes which were placed contralaterally to the anodal electrode over supraorbital regions; SAA stands for Self-Assessed Artistic Abilities (see Exploratory Approach); BFI-10 stands for the 10-item Big Five Inventory (Rammstedt & John, 2007); OFPT stands for Out-of-Focus-Picture Task (see Kozbelt, 2001).

**Creative drawing – Cued art making.** Participants were given three sheets of paper (29.7×27 mm; A4) in random order, each with a pre-printed cue (see Figure 1), from which they were instructed to begin drawing an artwork, with a provided black marker pen, that should be ‘aesthetically pleasing like one would find in a gallery or as made by an artist’. For each drawing participants had a time limit of three minutes, with a verbal warning given after two minutes. Participants were also told that they could draw whatever they wanted in any way they wanted, e.g., draw realistic and/or abstract, with the only requirement being that they should do so to the best of their ability.

**Internally vs. externally cued realistic drawing.** Previous art making/drawing literature typically differentiated between externally and internally cued drawing (e.g., Griffith & Bingman, 2020; Raimo et al., 2021). This differentiation can also be found in the present context, where e.g., Young et al. (2004) used an externally cued realistic drawing task namely copying from sight, whereas Snyder et al. (2003) used internally cued tasks where participants either had to draw from their own original imagery, or memory. Thus, the art making paradigm by Pelowski et al. (2019) was complemented by an internally cued drawing task, allowing to gain a more differentiated insight into realistic drawing abilities. This also allowed to investigate the role of FTRs in the stereotypicality of drawings, as, for example, increased stereotypicality has been observed in some FTD artists (de Souza et al., 2014; Thomas-Antérion et al., 2002); or as research suggested that ATLs may be involved in the storage of mental templates (see Chi & Snyder, 2011).

For the internally cued drawing task, participants were given a blank sheet of paper (A4) and were instructed to draw a running person to the best of their ability, using a black marker pen within three minutes. For the externally cued drawing task, participants were instructed to copy a photograph of a hand holding a pencil as realistically as possible, using a

pencil on a blank sheet of paper (A4), within five minutes; a warning was given after 2.5 minutes (see Figure 1).

**Transcranial direct current stimulation.** tDCS was delivered with a direct current stimulator (DC-STIMULATOR PLUS, neuroConn GmbH, Ilmenau Germany) using two rubber electrodes ( $5 \times 7$  cm:  $35 \text{ cm}^2$ ), which were applied on participant's scalp using a conductive paste (Ten20, Weaver and Company, Aurora, USA) in combination with a highly conductive electrolyte spray to reduce skin-impedance (SIGNA Spray-Electrode Solution, Parker Laboratories Inc., Fairfield, NJ, USA). After applying electrodes to the region of interest (ROI, see below), the pre-stimulation impedance was checked and in case of being below  $7 \text{ k}\Omega$ , the electrodes were fixed with an elastic rubber band. The anodal electrode in LFT was placed on the midpoint between F7 and T7, whereas for RFT on the midpoint between F8 and T8 according to the 10-20 electrode system (Jasper, 1958, see Figure 1). The cathodal electrode was placed contralaterally over supraorbital areas, which in previous studies was used to induce unilateral modulation (e.g., Cattaneo et al., 2014; Kincses et al., 2004).

Each experimental group featured two conditions—real vs. sham stimulation (within subject, randomized order)—with an average of 3.6 days (median = 3;  $SD = 4.5$ ; range: 2-27 days) for the LFT, and 3.2 days (median = 3;  $SD = 2.1$ ; range: 2-13 days) for RFT between sessions. The stimulation applied a constant current of 2 mA for 20 minutes with fade-in and fade-out phases of each 20 seconds; in the sham-stimulation, a current of 2 mA was applied for about 30 seconds with fade-in (8 s) and of fade-out (5 s) phases following a state of continuous impedance control where small pulses occurred ( $110 \mu\text{A}$  every 550 ms for 15 ms) and never exceeded an average current of  $2 \mu\text{A}$  not having a stimulatory effect.

To start the stimulation experimenters had to manually enter pre-assigned and counter-balanced subject-codes into the DC-stimulator, which determined the condition. As experimenters were naïve to the codes' assigned condition and as the stimulator did not display the type of stimulation, neither the participants, which currently were not aware of the possibility of a sham stimulation, nor experimenters were aware of the current experimental condition. Thus, the current experiment represented a double-blind and counter-balanced approach. As tDCS effects were found to last beyond the duration of the stimulation, even up to several hours (e.g., Miniussi et al., 2013; Nitsche et al., 2003; Polanía et al., 2018 for review), it was decided to employ an 'offline protocol' to minimize potential disturbing effects by the sensations of stimulation during drawing tasks. However, to maximize tDCS effects and minimize potential drop-off effects, art making tasks and subsequent measures were completed within 30 minutes after the end of stimulation.

### ***Exploratory approach***

In an exploratory approach, the current study also aimed to replicate findings of a positive relation between self-assessed artistic abilities and personality, or recognizing out-of-focus pictures and actual art making abilities (Chamberlain et al., 2013, 2019; Kozbelt, 2001; McManus et al., 2010; Pelowski et al., 2019; Pelowski, Leder, et al., 2017). Therefore, immediately after the art making paradigm, participants completed a self-assessment of artistic abilities (SAA, see Table 1), the 10-item Big Five Inventory (BFI-10; Rammstedt & John, 2007), and an out-of-focus picture task (OFPT, Kozbelt, 2001; picture-set from Schooler & Melcher, 1995).

The SAA consisted of two parts. The first part of SAA included a previously used set of scales for self-assessing drawing abilities (SADA) which was complemented by a scale to specifically assess realistic copying ability to better fit the current study's scope (Chamberlain et al., 2013; McManus et al., 2010, but see Pelowski et al., 2019). The second

part included a more general set of scales regarding artistic abilities such as one's creativity, current interest in art making or attention, the ability to imagine artworks either before or during drawing and was thought to supplement the rather technical/skill-focused nature of SADA and in the following will be referred as 'AIAIC' (see Table 3). 7-point scales were used for both parts of SAA, asking participants about their (current) self-assessment of artistic abilities (see Table 3), which for SADA ranged from (1) 'way below average' to 'much above average', and for AIAIC from (1) 'not at all' to (7) 'extreme'.

In addition to the replication of previous findings, the current study also investigated whether tDCS of left or right FTRs may alter self-perceived artistic abilities, personality, or performance on the OFPT and/or their relationship with actual art making abilities.

**Table 3**

*Scales used for self-assessment of artistic abilities (SAA)*

SADA	AIAIC
Drawing from observation (e.g., life drawing)	Artistic ability
Use of perspective, shadow, and shading	Interest in art making
Realistic copying of a photograph	Attention
Technical drawing (geometric drawing)	Imagining artworks before drawing
Use of contrast and tone in drawing	Imagining artworks during drawing
Confidence in mark making when drawing	Creativity

*Note.* SADA following Chamberlain et al. (2013) and McManus et al. (2010)

## **Part II: Assessment of art products**

### ***Participants (Judges)***

To assess the qualities of art products from Part I, 30 professional visual artists (18 females, 11 males, 1 other) with a mean age of 29.9 years ( $SD = 7$ , range: 22–59) were recruited via digital flyers posted in social networks and received 40 € for participation. All artists were enrolled in a Master of Fine Arts (MFA) program or already held an MFA. The decision to recruit professional artists was aimed at establishing a similar level of formal or canonical artistic training among raters that would qualify them to detect even small changes—due to tDCS—in art products. Participants thereby were randomly assigned to

either rate artworks from LFT (10 females, 5 males; mean age = 29.4 years,  $SD = 4.66$ , range: 25–37) or RFT (8 females, 6 males, 1 other; mean age = 30.33 years,  $SD = 9.9$ , range: 22–59). In the following, these participants will be referred as ‘judges’.

### ***Procedure***

The assessment of art products was done online between March and November 2021. Judges were briefed via email and had to provide confirmation of their MFA-enrolment or MFA-degree; once this was confirmed, the judges received a link to the online study generated via ‘Qualtrics’ (<https://www.qualtrics.com/uk/>). Judges were told that they would be looking at drawings by different people who may differ regarding their artistic abilities, and that they would have to rate the drawings based on the provided scales. Judges were instructed to rate the drawings as consistent as possible, and told to best finish within 1.5 hours, but this was not mandatory; it was recommended to take breaks to prioritize consistency over time. Average participation time (time from opening the link until the questionnaire was finished—may not represent actual time spent on the assessment—was 16.2 hours (Median = 3 h,  $SD = 23.1$ , range: 0.8–70.3 h). The use of mobile phones was not allowed. Note, for rating hand-copies, the original photograph was provided to help rate actual copy accuracy.

### **Table 4**

#### *Scales used for artwork assessment*

	Creative Drawing	Realistic Drawing
What is the aesthetic quality of the drawing?		How technically skilled is the drawing?
How creative is the drawing?		How realistic is the depiction?
How technically skilled is the drawing?		How stereotypical is the depiction?
How much do you personally like the drawing?		How (photo)realistic is the drawing?
How (photo)realistic is the drawing?		

*Note.* Externally cued drawings were assessed only their displayed (photo)realism



### *Materials*

The in total 600 produced drawings were scanned at 600 dpi using TIF format which resulted in high-quality digital images with each sized 4960×7015 px. To ensure optimal quality for experimental display, all scans were visually inspected and processed using the ‘GNU Image Manipulation Program’ software (GIMP; gimp.org). This processing included a transformation into grayscale; the removal of scanning-artifacts (e.g., sheet edges) in case located at least 150 px away from intentionally placed content/lines (this involved for most scans a cropping of 40 px on the left and 20 px on all other sides); rescaling to 25% of original image-size (1240×1753 px); and the addition of a black frame—about 9 px—to maintain image ratio in the experimental display. Scans of the hand copies overall showed poor visibility—likely due to weak contrasts as drawn by pencil—and thus were individually edited using the ‘color-curve’ tool to enhance contrasts. As the displaying size varied between horizontally and vertically oriented images, it was aimed to approximate equality of display size by converting vertically oriented images to a horizontal orientation. This was done by reducing vertical images to a height of 1242 px (keeping the ratio constant) and the addition of a white canvas, equally sized to the left and right, to a total width of 1761 px. Although this adjustment approximated size equality, it should be noted that the display size of the vertical and horizontal images still differed slightly (see Figure 2, left and right panels).

### *Analyses*

**Confirmatory analysis.** Data was analyzed using linear mixed effects models (LMEMs) with maximum-likelihood estimates, as such models allow to control simultaneously for variability within and across artworks, artists, and judges and generally are considered robust, even if statistical assumptions are violated (e.g., Brown, 2021; Schielzeth et al., 2020). Therefore, a LMEM for each DV was conceptualized with condition (sham vs. stimulation) and session (first vs. second) as fixed effects, allowed to interact.

Random effects (REs) were based on Barr et al. (2013) and Barr (2013) and included: artists and judges, both with random intercepts and random slopes for condition and session as both represent within factors for participants and judges. Note, final RE-structures may differ from a priori conceptualization (e.g., failure to converge or singular fit issues); all changes to the RE-structure will be reported in the results. Sum-contrasts were used, where factors of condition and session were recoded to  $-0.5$  and  $0.5$ ; thus, contrast-values refer to a change in one unit i.e., from sham to stimulation and first to second session.

**Exploratory analysis.** For obtaining an overview of whether tDCS generally affected exploratory measures, paired, two-sided *t*-tests were employed. To explore how exploratory measures related to artists' actual art making abilities, and whether this relation was affected by tDCS, for each measure a LMEM was conceptualized (SADA, AIAIC, BFI-10 & OFPT). Each LMEM included single scales (SAA) or scores (BFI-10 & OFPT) as fixed effects, each allowed to interact with condition and artists and judges with condition as intercepts and random slopes were included as REs. In a final step, for each LMEM (except the OFPT model, as only including one fixed effect), the most parsimonious, data-driven models were derived via backward-elimination to obtain insight into the relevance of single scales for different aspects of visual art making.

**Veracity of the art making and assessing paradigm.** To assess the quality of the dataset obtained and thus the veracity of the used art making and assessing paradigm, the drivers of variance for individual artwork ratings were explored by employing the same analyses as reported by Pelowski et al. (2019). The interest here was to which degree artworks by one artist received similar ratings i.e., showed inter-artwork agreement indicating whether the sample of artworks produced by artists indeed allowed to capture their underlying artistic abilities. Higher inter-artwork agreement thereby would suggest that more variance is explained by artists' underlying artistic abilities, while lower agreement would

indicate a rather arbitrary nature of the art products, probably suggesting a too small artwork sample size for providing a robust measure of underlying artistic abilities (Pelowski et al., 2019, p.469).

Veracity analyses therefore included three measures: (a) Cronbach's alpha for the agreement between artworks produced by each artist, (b) Cronbach's alpha for the agreement between judges based on averaged ratings per artist and in an exploratory approach based on single artwork ratings, possibly minimizing information loss, and (c) main variance component analyses to investigate the variance explained by artists i.e., participants ( $\text{var}_P$ ), individual artworks ( $\text{var}_A$ ), judges ( $\text{var}_J$ ) and random error.

In the case of (a) and (b), higher alphas would indicate a relatively higher veracity of the paradigm as for (a) this would show higher inter-artwork agreement and therefore likely reflecting artists' underlying ability, for (b) that judges rated artists/artworks similarly, indicating a shared understanding of assessment factors. For (c), a higher explained variance of artists relative to artworks would indicate a certain robustness of the measurement of artists' underlying artistic abilities; as a quick indicator, the ratio  $\text{var}_P / (\text{var}_P + \text{var}_A)$  was calculated where values greater than 0.5 would indicate that more than half of the variance is explained by artists (see Pelowski et al., 2019, p. 469). Variance components were obtained using LMEMs with restricted maximum-likelihood estimates, with no fixed effects or random effects (intercept-only model) including artists i.e., participants ( $\text{var}_P$ ), artworks ( $\text{var}_A$ ), judges ( $\text{var}_J$ ).

To account for the current experimental design, these measures were obtained separately for each condition, but also for the entire set of artworks (i.e., doubling the sample size). Although measures based on the entire set of artworks may be limited by the influence

of tDCS, these measures could be of interest for future research, for example by showing how veracity changes as the number of artworks per artist increases.

All analyses were carried out with R (v 4.1.2; <https://www.r-project.org/>). The following packages were used: for performing LMEMs ‘lme4’ (v 1.1-28), for calculating  $p$ -values ‘lmerTest’ (v3.1.3), for adjusting  $p$ -values based on Benjamini and Hochberg (1995) ‘rstatix’ (v 0.7.0), for estimating marginal means ‘emmeans’ (v 1.7.2), and for calculating Cronbach’s alpha ‘psych’ (v 2.1.9).

## Results

Descriptive statistics of artwork ratings can be found in Table A3, which shows that ratings overall were similar between experimental groups and on average were lower than three for most scales. However, in the following, results will be discussed beginning with the veracity of the paradigm, as these results are also relevant for interpretation of subsequent results.

### Veracity of art making and assessing paradigm

Detailed statistics of the veracity analyses can be found in Table 5.

#### *Agreement between artists’ artworks*

Cronbach’s alphas based on all artwork-sets, including artworks from both sessions (sham & stimulation), showed that the agreement of artwork-sets was highest for realism and technical drawing skill, with alphas ranging between 0.76 (skill, RFT) and 0.82 (realism, LFT), and was consistently lowest for liking with alphas not exceeding values of 0.4. Alphas for aesthetic quality and creativity ranged between 0.43 (quality, RFT) and 0.65 (creativity, LFT). A comparison between conditions showed notable differences in both groups, which in the following will be expressed by delta ( $\Delta$ ), calculated by subtracting ‘sham-alphas’ from ‘stimulation-alphas’ ( $\alpha_{x.Stimulation} - \alpha_{x.Sham} = \Delta_x$ ). A positive delta thereby would indicate that

artworks received more similar ratings after tDCS, whereas a negative delta would indicate that art works received less similar ratings after tDCS compared to sham.

The mean of all deltas ( $m_{\Delta}$ ) in LFT was negative ( $m_{\Delta.LFT} = -0.3$ ), which was similar, but positive in RFT ( $m_{\Delta.RFT} = 0.27$ ). The main drivers of deltas in both groups were the scales of aesthetic quality (AQ;  $\Delta_{AQ.LFT} = -0.49$ ;  $\Delta_{AQ.RFT} = 0.59$ ) and liking (L;  $\Delta_{L.LFT} = -0.49$ ;  $\Delta_{L.RFT} = 0.66$ ). Note, alphas for quality and liking were close to zero in LFT and even negative in RFT, indicating an average negative or close-to-zero covariance of artworks' ratings and thus suggest rather a disagreement between artworks, but see Discussion.

### *Agreement between judges*

Cronbach's alphas for judges based on averaged ratings from both conditions (sham & stimulation), showed that judges agreed the most on realism, skill, and creativity with alphas ranging between 0.83 (creativity, RFT) and 0.96 (realism, LFT). The lowest agreement was found for aesthetic quality and liking with alphas ranging between 0.37 (liking, LFT) and 0.65 (quality, LFT). Alphas based on ratings of single artworks overall replicated this trend but tended to be lower (see Table 5). A comparison between conditions showed no notable differences of alphas in LFT, but overall higher alphas after tDCS in RFT ( $m_{Jp.\Delta.RFT} = 0.16$ ), with main drivers being aesthetic quality ( $\Delta_{Jp.AQ.RFT} = 0.31$ ) and liking ( $\Delta_{Jp.L.RFT} = 0.33$ ). Interestingly, these differences were less pronounced considering alphas based on single artworks, especially for quality ( $\Delta_{Ja.AQ.RFT} = 0.13$ ) and liking ( $\Delta_{Ja.L.RFT} = 0.06$ ).

### *Variance component analysis*

Variance components based on ratings of all artworks (sham & stimulation) showed that for both groups, most artwork-sets and rating factors, variance explained by individual artworks was higher than explained by individual artists, i.e.,  $ratio_{P-A}$  was lower than 0.5. A

comparison of variance components between conditions showed notable differences, but still variance explained by artworks was overall higher than explained by artists. The mean ratio<sub>P-A</sub> ( $m_{RPA}$ ) was higher in LFT sham condition compared to stimulation ( $m_{RPA,\Delta,LFT} = -0.3$ ) but was lower in RFT sham condition compared to stimulation ( $m_{RPA,\Delta,RFT} = 0.16$ ). Interestingly, only in LFT sham condition—except creativity—variance explained by artists was equal or higher than explained by artworks. As the veracity analyses indicated a rather heterogeneous dataset regarding aesthetic quality, liking, and in part for creativity, it was aimed to account for this by adjusting random effects. Thus, pre-printed cues were added as nested factors within artists' REs. In the following, confirmatory and exploratory results will be reported separately for both experimental groups.

**Table 5**

*Results of veracity analyses for the art making and assessing paradigm*

DVs	$\alpha$			Variance Components				
	Artwork sets	Judges (p.P.)	Judges (p.A)	Var <sub>P</sub>	Var <sub>A</sub>	Var <sub>J</sub>	Error	Ratio <sub>P-A</sub>
<b>LFT</b>								
<b>Both Conditions</b>								
Aesthetic Quality	0.52	0.65	0.62	0.02	0.08	0.50	0.91	.23
Creativity	0.65	0.84	0.77	0.05	0.13	0.49	0.80	.30
Skill	0.78	0.89	0.78	0.07	0.08	0.79	0.64	.47
Liking	0.27	0.37	0.51	0.01	0.08	0.64	1.31	.12
Realism	0.82	0.96	0.92	0.17	0.20	0.32	0.44	.46
<b>Stimulation</b>								
Aesthetic Quality	0.08	0.63	0.67	0	0.12	0.49	0.88	0
Creativity	0.24	0.8	0.78	0.02	0.16	0.46	0.77	.11
Skill	0.63	0.86	0.79	0.08	0.08	0.76	0.62	.48
Liking	0.01	0.43	0.51	0	0.09	0.61	1.29	.02
Realism	0.64	0.95	0.92	0.14	0.22	0.31	0.44	.40
<b>Sham</b>								
Aesthetic Quality	0.57	0.61	0.54	0.04	0.04	0.50	0.94	.53
Creativity	0.58	0.8	0.77	0.07	0.12	0.53	0.83	.37
Skill	0.65	0.86	0.77	0.08	0.08	0.81	0.66	.50
Liking	0.50	0.55	0.5	0.05	0.04	0.66	1.33	.51
Realism	0.80	0.96	0.93	0.22	0.15	0.32	0.44	.60
<b>RFT</b>								
<b>Both Conditions</b>								
Aesthetic Quality	0.43	0.61	0.57	0.02	0.07	0.67	1	.19
Creativity	0.59	0.83	0.76	0.06	0.16	0.57	0.98	.26
Skill	0.76	0.86	0.71	0.07	0.07	0.54	0.84	.48
Liking	0.40	0.62	0.58	0.02	0.11	0.56	1.44	.18
Realism	0.79	0.95	0.91	0.21	0.29	0.38	0.75	.42
<b>Stimulation</b>								
Aesthetic Quality	0.56	0.7	0.62	0.05	0.06	0.67	1.01	.45
Creativity	0.44	0.83	0.79	0.07	0.18	0.61	0.95	.27
Skill	0.71	0.84	0.74	0.10	0.07	0.60	0.86	.60
Liking	0.41	0.7	0.61	0.05	0.10	0.59	1.35	.32

Realism	0.68	0.95	0.92	0.26	0.31	0.40	0.75	.46
<b>Sham</b>								
Aesthetic Quality	-0.03	0.39	0.49	0	0.07	0.66	1.01	0
Creativity	0.49	0.78	0.73	0.06	0.12	0.52	1.02	.34
Skill	0.52	0.75	0.66	0.04	0.06	0.47	0.82	.41
Liking	-0.25	0.37	0.55	0	0.13	0.53	1.52	0
Realism	0.73	0.93	0.90	0.24	0.20	0.36	0.76	.54

*Note.* DVs for Dependent variables; p.A. means per artwork; p.P. means per participant;  $Var_p$  means variance of participants;  $Var_A$  means variance of artworks;  $Var_j$  means variance of judges;  $Ratio_{p-A}$  was calculated by  $var_p / (var_p + var_a)$ .

## Confirmatory results: LFT

### *Creative drawing*

Due to failure of convergence and/or singular-fit warnings, RE-structure was adjusted. For judges' REs stimulation and session were removed from all models, except for skill, where only session was removed. For artists' REs condition was removed from all artists' REs, except for quality and realism, where only session was removed.

Results showed no effects of left anodal frontotemporal tDCS on creative drawing. Detailed results can be found in Table 6 and are visualized in Figure 3. A session effect for liking was found, where drawings of the second session were liked more compared to those from the first session.

### *Realistic drawing*

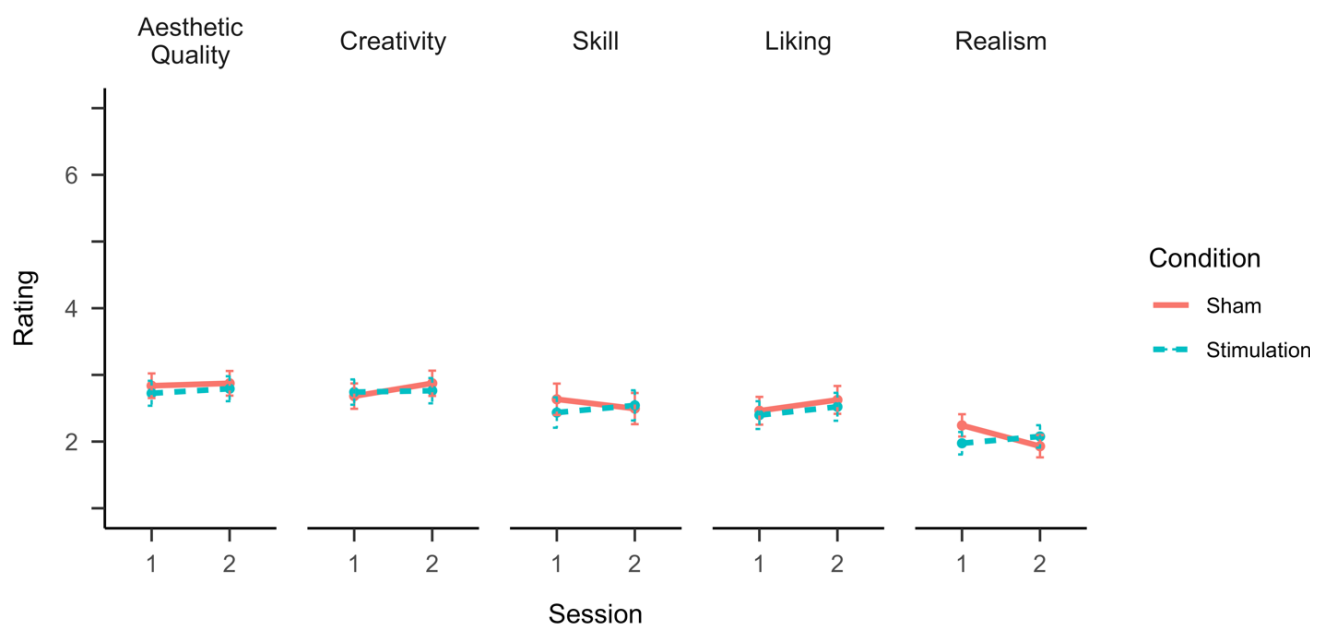
Due to failure of convergence and/or singular-fit warnings, REs-structure was adjusted. For judges' REs condition and session were removed from all modes, except for skill where only session was removed. For artists' REs condition was removed from the internally cued realism model, and condition and session from the stereotypicality model.

Results showed that internally cued realistic drawings were more stereotypical after left frontotemporal tDCS compared to sham; no other effects were found. Detailed results can be found in Table 7 and are visualized in Figure 4.

**Table 6***Confirmatory results for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.18	2.46	3.16	15.6	<.001***
Stimulation	-0.1	0.06	-0.21	0.01	90	.165
Session	0.05	0.06	-0.06	0.16	90	.458
Stimulation × Session	0.03	0.12	-0.21	0.27	89.1	.803
<b>Creativity</b>						
Intercept	2.77	0.18	2.41	3.12	16.2	<.001***
Stimulation	-0.03	0.06	-0.15	0.1	90	.694
Session	0.11	0.06	-0.02	0.23	90	.196
Stimulation × Session	-0.17	0.16	-0.48	0.14	89.1	.372
<b>Skill</b>						
Intercept	2.53	0.22	2.09	2.97	15.8	<.001***
Stimulation	-0.08	0.05	-0.17	0.02	45.3	.189
Session	-0.02	0.05	-0.11	0.08	90	.743
Stimulation × Session	0.25	0.16	-0.06	0.55	89.1	.189
<b>Liking</b>						
Intercept	2.5	0.2	2.11	2.9	15.4	<.001***
Stimulation	-0.08	0.06	-0.2	0.03	90	.189
Session	0.14	0.06	0.03	0.26	90	.027*
Stimulation × Session	-0.04	0.13	-0.3	0.22	89.1	.769
<b>Realism</b>						
Intercept	2.06	0.15	1.76	2.35	19.2	<.001***
Stimulation	-0.06	0.07	-0.2	0.08	90	.401
Session	-0.11	0.07	-0.25	0.04	90	.197
Stimulation × Session	0.41	0.21	-0.01	0.84	89.2	.112

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

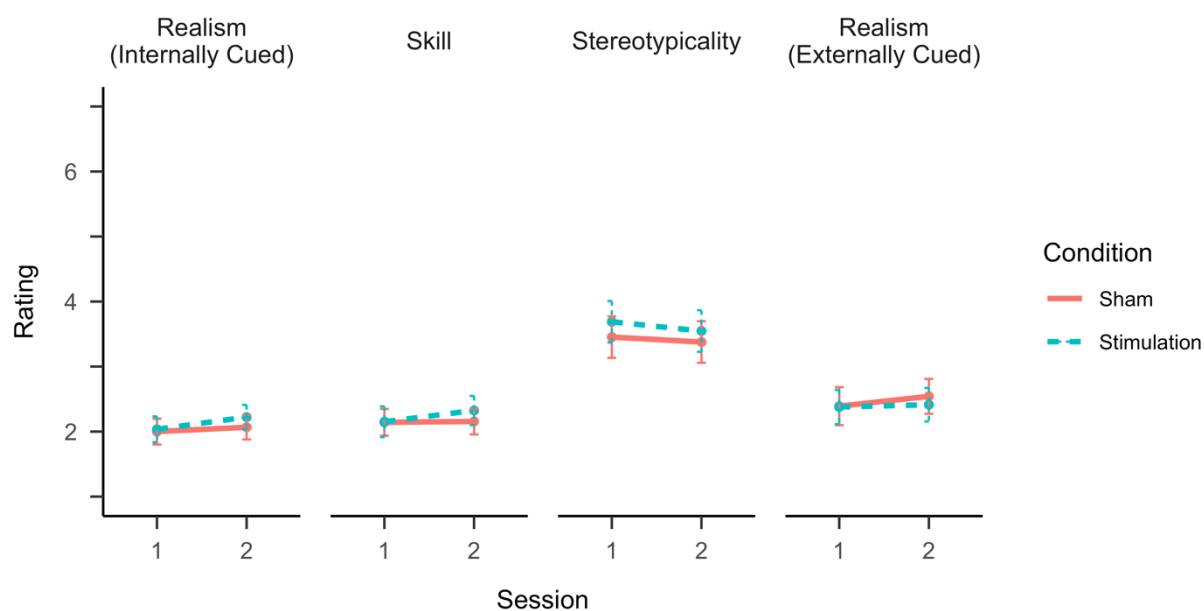
**Figure 3***Confirmatory results for creative drawing in LFT*

Note. Values depicted represent estimated marginal means which do not necessarily represent the observed means.

**Table 7***Confirmatory results for realistic drawing in LFT*

Predictors	Estimate	SE	95% CI		df	$p_{adj}$
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.74	2.42	22.1	<.001***
Stimulation	0.1	0.06	-0.02	0.21	30	.147
Session	0.13	0.06	0.01	0.24	30	.074
Stimulation × Session	0.12	0.31	-0.49	0.73	29.4	.705
<b>Skill</b>						
Intercept	2.19	0.19	1.81	2.57	21.4	<.001***
Stimulation	0.09	0.08	-0.07	0.24	22.8	.362
Session	0.09	0.07	-0.05	0.23	26.7	.362
Stimulation × Session	0.16	0.34	-0.5	0.82	29.4	.638
<b>Stereotypicality</b>						
Intercept	3.52	0.31	2.91	4.12	15.7	<.001***
Stimulation	0.2	0.08	0.05	0.35	856	.019*
Session	-0.11	0.08	-0.26	0.04	856	.214
Stimulation × Session	-0.07	0.24	-0.54	0.4	29.1	.783
<b>Realism (Externally Cued)</b>						
Intercept	2.43	0.23	1.99	2.88	27.2	<.001***
Stimulation	-0.07	0.11	-0.28	0.14	23.2	.677
Session	0.09	0.11	-0.11	0.3	23.2	.677
Stimulation × Session	-0.12	0.5	-1.1	0.87	29.5	.82

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; df = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Figure 4***Confirmatory results for realistic drawing in LFT*

Note. Values depicted represent estimated marginal means which do not necessarily represent the observed means.

## Exploratory results: LFT

### *Global SAA scores*

To provide a more comprehensive understanding of results regarding SAA—in addition to single scales—two average scores of self-ratings per instrument were calculated, as for the SADA such score was able to predict actual drawing ability (McManus et al., 2010), and in the following will be referred to as ‘global scores’ or SADA<sub>G</sub> and AIAIC<sub>G</sub>. Consistent with previous research, item correlations overall were positive for both instruments and groups (except for artistic ability and attention; imagination before drawing and interest, in AIAIC of RFT, but see Tables A4–A7); and Cronbach’s alphas for both instruments were larger than 0.7 (Chamberlain et al., 2013; McManus et al., 2010). This may indicate that each instrument corresponds to one underlying factor, which, speculatively, in the case of SADA could represent drawing skill, and for AIAIC a more general artistic ability/creativity. Thus, in addition to LMEMs with single scale, LMEMs with global scores for each DV were run (same RE-structure as other exploratory models).

### *Group differences of exploratory measures in LFT*

Results of the *t*-tests can be found in Table 8, showing no differences of exploratory measures between experimental groups after *p*-values were corrected following Benjamini & Hochberg (1995).

**Table 8**

*Comparison of exploratory measures between conditions in LFT*

Scale	Sham		Stimulation		<i>t</i>	<i>df</i>	<i>p<sub>adj</sub></i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<b>Out of Focus Picture Task</b>	10.1	2.67	10.15	2.85	−0.1	29	.944
<b>AIAIC</b>							
Global	3.76	0.94	3.6	1.05	0.7	29	.944
Attentive	4.73	1.31	4.93	1.08	−0.7	29	.944
Interest in art making	4.03	1.56	3.8	1.75	0.6	29	.944
Creativity	3.5	1.59	3.6	1.38	−0.3	29	.944
Artistic ability	2.9	1.52	2.8	1.52	0.4	29	.944
Imagination before drawing	3.13	1.66	2.5	1.33	2.3	29	.6
Imagination during drawing	4.23	1.3	3.97	1.75	1	29	.944

<b>SADA</b>							
Global	2.98	1.25	2.97	1.01	0.1	29	.944
Drawing from observation	2.83	1.32	3	1.29	-1	29	.944
Using perspective and shading	2.97	1.4	3.03	1.33	-0.4	29	.944
Realistic copying	2.9	1.6	2.73	1.46	0.7	29	.944
Technical drawing	3.13	1.43	3.03	1.22	0.5	29	.944
Using contrast and tone	2.9	1.58	3	1.34	-0.6	29	.944
Confidence in mark making	3.13	1.43	3	1.2	0.6	29	.944
<b>BFI-10</b>							
Agreeableness	7.34	1.80	7.45	1.90	-0.4	29	.944
Conscientiousness	6.41	2.10	6.48	1.88	-0.2	29	.944
Extraversion	6.59	1.80	6.86	1.87	-1.2	29	.944
Neuroticism	5.14	1.83	5.10	1.74	0.2	29	.944
Openness	7.17	1.79	6.86	1.88	1	29	.944

*Note.* One participant did not complete the BFI-10, hence, means and *SDs* reported are from the remaining 29 participants. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

### ***The relation between exploratory measures and creative drawing in LFT***

Due to singular-fit warnings RE-structure was adjusted. For judges' REs stimulation was removed from all models, except for the skill models. Detailed results for models including all scales, global SAA scores, and OFPT can be found in Tables A8-A13; for backward eliminated models of SAA and personality models see in Table 9 (AIAIC), Table 10 (SADA), and Table 11 (BFI-10). Several effects were found, which in the following will be reported for each DV separately. Note, reported *p*-values were corrected following Benjamini and Hochberg (1995) and that reported interactions with tDCS always include a comparison against sham condition.

**Aesthetic Quality.** No relation between OFPT performance or personality and quality was found. Both AIAIC<sub>G</sub> and SADA<sub>G</sub> were positively related to quality (SADA<sub>G</sub>:  $b = 0.07$ ,  $t(118.2) = 2.65$ ,  $p = .018$ , 95% CI [0.02, 0.13]; AIAIC<sub>G</sub>:  $b = 0.09$ ,  $t(160.6) = 3.23$ ,  $p = .003$ , 95% CI [0.04, 0.15]). Single-scale models showed an effect of stimulation for SADA, indicating lower quality after stimulation ( $b = -0.15$ ,  $t(93.9) = -2.61$ ,  $p = .049$ , 95% CI [-0.26, -0.04]), and that self-assessed realistic copying ability was negatively related to quality ( $b = -0.12$ ,  $t(139.2) = -3.39$ ,  $p = .006$ , 95% CI [-0.2, -0.05]). Backward elimination also showed a negative relation between agreeableness and quality. Also, additional effects for

SAA were found, where self-assessed artistic ability, ability to imagine artworks before drawing, draw from observation, and using contrast were positively related to quality.

**Creativity.** A positive relation between OFPT performance and creativity was found ( $b = 0.04$ ,  $t(164.2) = 2.66$ ,  $p = .017$ , 95% CI [0.01, 0.06]). No relation between personality, global scores or single SAA scales and creativity was found. Backward elimination showed a negative relation between neuroticism and creativity.

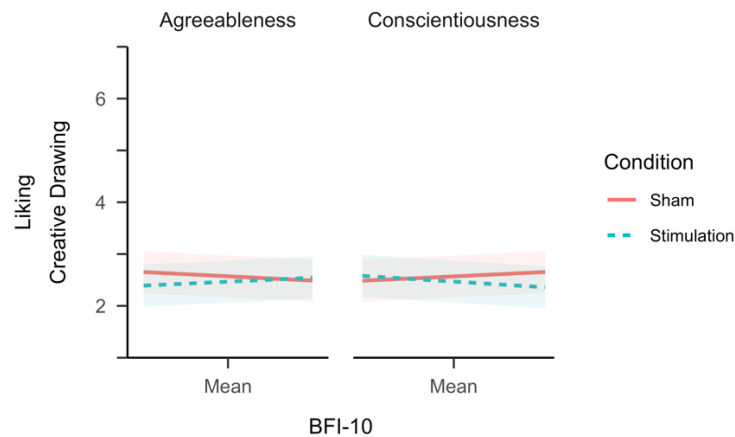
**Skill.** No relation between OFPT performance and skill was found. A positive relation between openness and skill was found ( $b = 0.07$ ,  $t(156.3) = 3.44$ ,  $p = .004$ , 95% CI [0.03, 0.11]). Both AIAIC<sub>G</sub> and SADA<sub>G</sub> were positively related to skill (SADA<sub>G</sub>:  $b = 0.1$ ,  $t(144.6) = 3.01$ ,  $p = .006$ , 95% CI [0.03, 0.16], AIAIC<sub>G</sub>:  $b = 0.11$ ,  $t(175.4) = 3.52$ ,  $p = .001$ , 95% CI [0.05, 0.18]). Single-scale models showed that self-assessed artistic ability was positively related to skill ( $b = 0.1$ ,  $t(170.5) = 3.66$ ,  $p = .002$ , 95% CI [0.04, 0.15]) and that realistic copying ability was negatively related to skill ( $b = -0.13$ ,  $t(167.3) = -3.22$ ,  $p = .011$ , 95% CI [-0.22, -0.05]). Backward elimination also showed a negative relation between extraversion and skill. Also, self-assessed ability to imagine artworks before drawing, draw from observation, and use of perspective were positively related to skill, and an effect of stimulation in the SADA model was found, indicating lower skill after stimulation compared to sham.

**Liking.** A positive relation between OFPT performance and liking was found ( $b = 0.03$ ,  $t(160.8) = 2.37$ ,  $p = .038$ , 95% CI [0, 0.05]). No relation between personality, global scores or single SAA scales, and liking was found. Backward elimination showed two interactions between personality and tDCS, where artworks from artists with lower agreeableness were liked less after stimulation; and artworks from artists with higher

conscientiousness were liked less after stimulation (see Figure 5). Also, a negative relation between self-assessed attention and liking was found.

### Figure 5

*Interactions between LFT-tDCS and personality regarding liking of creative drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean. Shades represent 95% confidence intervals.

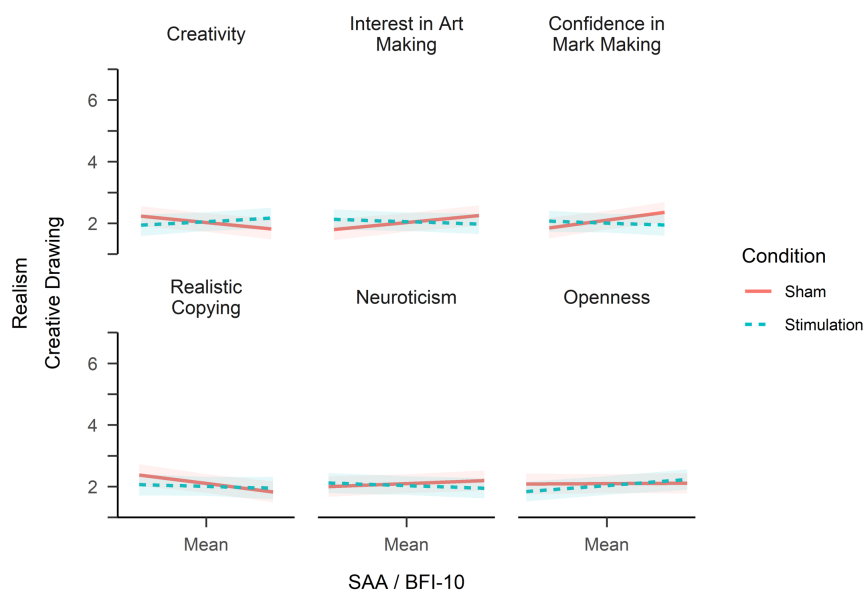
**Realism.** No relation between OFPT performance or personality and realism was found. Both  $AIAIC_G$  and  $SADA_G$  were positively related to realism ( $SADA_G$ :  $b = 0.11$ ,  $t(141.6) = 2.53$ ,  $p = .025$ , 95% CI [0.03, 0.2];  $AIAIC_G$ :  $b = 0.17$ ,  $t(175.6) = 3.76$ ,  $p > .001$ , 95% CI [0.08, 0.26]). Single-scale models showed a negative relation between self-assessed realistic copying ability and realism ( $b = -0.17$ ,  $t(156.5) = -2.94$ ,  $p = .027$ , 95% CI [-0.29, -0.06]).

Backward elimination showed a positive relation between openness and realism, and two interactions between personality and tDCS, where artworks from artists with lower openness were less realistic after stimulation and artworks from artists with higher neuroticism were less realistic after stimulation (Figure 6, bottom-right panels). Also, additional effects for SAA were found, where self-assessed ability to imagine artworks before drawing, to draw from observation, and artistic ability were positively related to realism. Also interactions between SAA and tDCS were found where artworks from artists with higher self-

assessed creativity were more realistic after stimulation, but less realistic for artists with lower self-ratings; artworks from artists with lower interest in art making were more realistic after stimulation, but less realistic for artists with higher interest; artworks from artists with higher confidence in mark making were less realistic after stimulation, but were more realistic for artists with lower confidence; artworks from artists with lower self-rated realistic copying ability were less realistic after stimulation (Figure 6).

**Figure 6**

*Interactions between LFT-tDCS, personality, and SAA regarding realism of creative drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean. Shades represent 95% confidence intervals.

**Table 9**

*Results of backward elimination for AIAIC and creative drawing in LFT*

DV	Predictor	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.81	0.18	2.46	3.16	15.5	<.001***
	Imagination before drawing	0.04	0.02	0.01	0.08	145.6	.02*
	Artistic ability	0.06	0.02	0.02	0.10	135.1	.006**
<b>Creativity</b>							
	Intercept	2.77	0.18	2.35	3.18	16.25	<.001***
<b>Skill</b>							
	Intercept	2.52	0.22	2.09	2.96	15.6	<.001***
	Imagination before drawing	0.06	0.02	0.02	0.10	171	.004**
	Artistic ability	0.09	0.02	0.05	0.13	156.1	<.001***
<b>Liking</b>							
	Intercept	2.5	0.20	2.11	2.90	15.4	<.001***

Attention	-0.06	0.03	-0.11	-0.01	173.8	.026*
<b>Realism</b>						
Intercept	2.04	0.15	1.75	2.33	18	<.001***
Stimulation	0.03	0.08	-0.12	0.18	92	.721
Creativity	-0.03	0.04	-0.11	0.04	174.3	.469
Interest in art making	0.05	0.03	-0.02	0.11	151.9	.208
Imagination before drawing	0.10	0.03	0.04	0.16	146.6	.005**
Artistic ability	0.10	0.03	0.03	0.16	156.2	.012*
Creativity × Stimulation	0.22	0.07	0.08	0.36	177.3	.006**
Interest × Stimulation	-0.18	0.06	-0.30	-0.06	163.5	.009**

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table 10**

*Results of backward elimination for SADA and creative drawing in LFT*

DV	Predictor	Estimate	SE	95% CI		$df$	$p_{adj}$
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.81	0.18	2.46	3.16	15.4	<.001***
	Stimulation	-0.14	0.06	-0.25	-0.03	94.4	.018*
	Drawing from observation	0.08	0.04	0.01	0.16	148.5	.037*
	Using contrast and tone	0.09	0.03	0.03	0.16	116.7	.004**
	Realistic copying	-0.11	0.03	-0.17	-0.05	149.9	.002**
<b>Creativity</b>							
	Intercept	2.77	0.18	2.35	3.18	15.6	<.001***
<b>Skill</b>							
	Intercept	2.53	0.22	2.09	2.97	15.6	<.001***
	Stimulation	-0.12	0.05	-0.22	-0.02	95.1	.023*
	Drawing from observation	0.11	0.04	0.03	0.19	174.3	.017*
	Using perspective and shading	0.10	0.04	0.02	0.18	130.2	.023*
	Realistic copying	-0.11	0.04	-0.18	-0.03	167.7	.017*
<b>Liking</b>							
	Intercept	2.5	0.20	1.92	3.08	165.9	<.001***
<b>Realism</b>							
	Intercept	2.05	0.15	1.76	2.35	18.7	<.001***
	Stimulation	-0.09	0.07	-0.24	0.05	87.8	.204
	Drawing from observation	0.15	0.06	0.04	0.27	165.9	.023*
	Confidence in mark making	0.07	0.05	-0.02	0.16	172.7	.124
	Realistic copying	-0.11	0.05	-0.21	-0.01	177.5	.046*
	Confidence marks × Stimulation	-0.24	0.08	-0.39	-0.09	116.8	.007**
	Realistic copying × Stimulation	0.14	0.06	0.02	0.27	105.1	.046*

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table 11**

*Results of backward elimination for BFI-10 and creative drawing in LFT*

DV	Predictor	Estimate	SE	95% CI		$df$	$p_{adj}$
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.83	0.18	2.48	3.18	15.5	<.001***
	Agreeableness	-0.04	0.02	-0.07	0	111	.027*
<b>Creativity</b>							
	Intercept	2.77	0.18	2.42	3.12	16.3	<.001***
	Neuroticism	-0.05	0.02	-0.10	-0.01	112.6	.023*
<b>Skill</b>							
	Intercept	2.54	0.23	2.09	2.98	15.7	<.001***
	Extraversion	-0.05	0.02	-0.08	-0.01	133.8	.020*
	Openness	0.08	0.02	0.04	0.11	162.8	<.001***
<b>Liking</b>							

Intercept	2.52	0.20	2.12	2.91	15.3	<.001***
Stimulation	-0.10	0.06	-0.22	0.01	87.2	.115
Agreeableness	0	0.02	-0.04	0.03	114.1	.919
Consciousness	-0.01	0.02	-0.04	0.03	125.9	.811
Openness	-0.03	0.02	-0.07	0	130.6	.115
Agreeableness × Stimulation	0.09	0.03	0.02	0.15	109.2	.026*
Consciousness × Stimulation	-0.10	0.03	-0.16	-0.03	120.5	.014*
Openness × Stimulation	0.07	0.04	0	0.14	122.8	.091
<b>Realism</b>						
Intercept	2.07	0.15	1.77	2.36	19.2	<.001***
Stimulation	-0.06	0.07	-0.20	0.08	87.3	.453
Neuroticism	0	0.03	-0.05	0.06	135.4	.894
Openness	0.06	0.03	0.01	0.11	168.5	.049*
Neuroticism × Stimulation	-0.10	0.04	-0.19	-0.02	101	.049*
Openness × Stimulation	0.10	0.04	0.01	0.19	112.8	.049*

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

### *The relation between exploratory measures and realistic drawing in LFT*

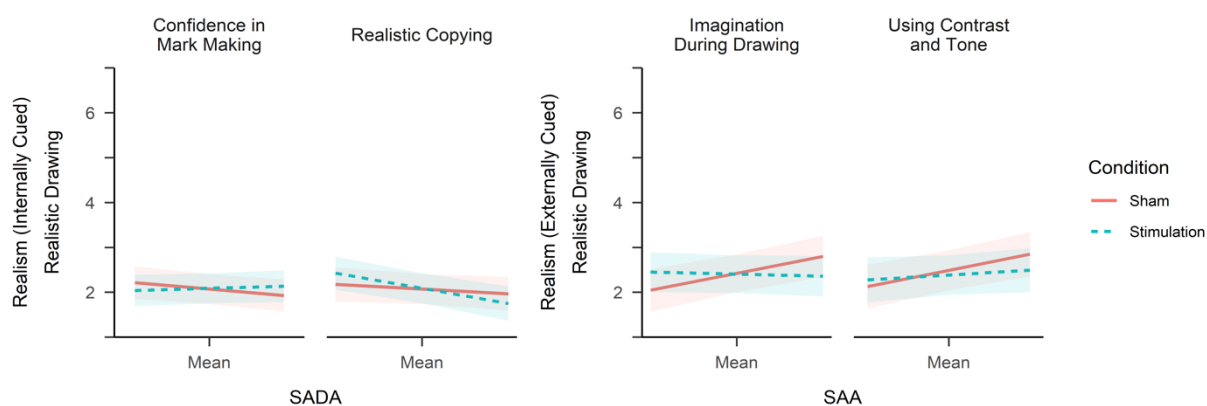
Due to singular-fit warnings, REs-structure was adjusted. For judges' REs condition was removed from all models, except for skill (except global score models). For artists' REs condition was removed from all stereotypicality models and for internally cued realism of the SADA model. Detailed statistics for models including all scales, global SAA scores, and OFPT can be found in Tables A14–A19; for backward eliminated models of SAA and personality models see in Table 12 (AIAIC), Table 13 (SADA), and Table 14 (BFI-10). Several effects were found, which in the following will be reported for each DV separately. Note, reported  $p$ -values were corrected following Benjamini and Hochberg (1995) and that reported interactions with tDCS always include a comparison against sham condition.

**Realism (Internally Cued).** No relation between OFPT performance or personality and realism was found. AIAIC<sub>G</sub> was positively related to realism ( $b = 0.13$ ,  $t(49.2) = 2.78$ ,  $p = .015$ , 95% CI [0.04, 0.23]). Single-scale models showed only effects for SADA, where self-assessed ability to draw from observation ( $b = 0.17$ ,  $t(226.2) = 2.91$ ,  $p = .022$ , 95% CI [0.05, 0.28]) and use of perspective ( $b = 0.23$ ,  $t(193.6) = 2.81$ ,  $p = .022$ , 95% CI [0.07, 0.39]) were positively related to realism, whereas self-assessed ability of technical drawing ( $b = -0.13$ ,  $t(200.6) = -2.76$ ,  $p = .022$ , 95% CI [-0.21, -0.04]) and realistic copying ( $b = -0.15$ ,  $t(157.4) = -2.59$ ,  $p = .03$ , 95% CI [-0.26, -0.04]) were negatively related to realism.

Backward elimination showed that agreeableness was negatively related to realism, and an effect of stimulation, indicating higher realism after stimulation. Also, additional effects for SAA were found, where self-assessed ability to imagine artworks before drawing and artistic ability were positively related to realism, and an effect of stimulation in the AIAIC model, indicating higher realism after stimulation. Two interactions between SADA and tDCS were found, indicating that artworks from artists with higher confidence in mark making were more realistic after stimulation, but less realistic for artists with lower confidence, and that artworks from artists with lower self-assessed realistic copying ability were more realistic after stimulation, but less realistic for artists with higher self-ratings (see Figure 7, left panel).

**Figure 7**

*Interactions between LFT-tDCS and SAA regarding realism of realistic drawings*



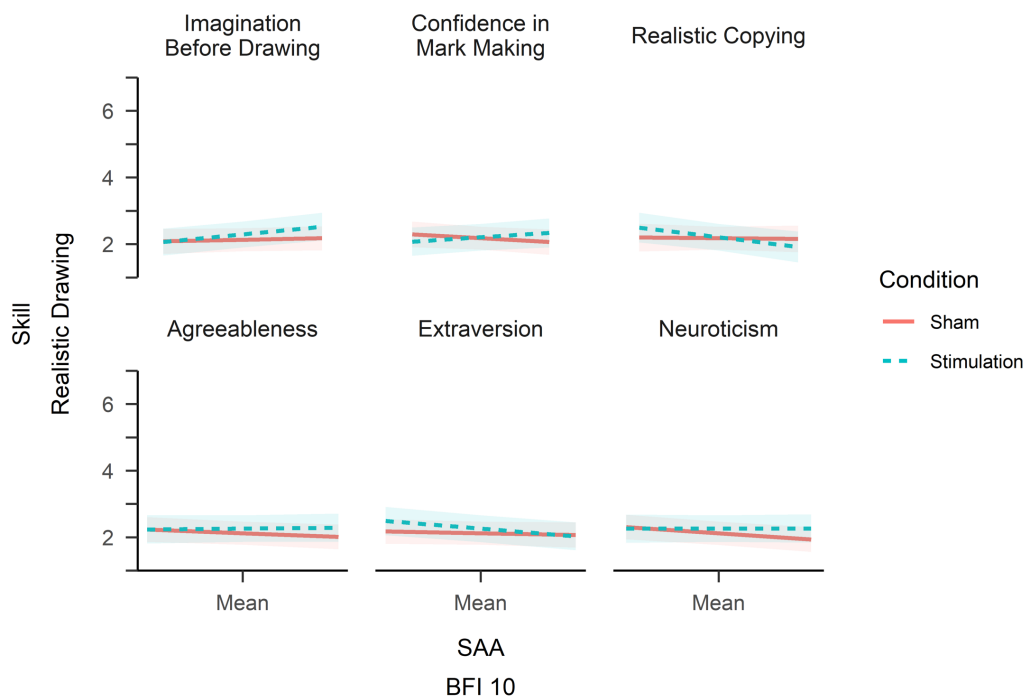
*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean. Shades represent 95% confidence intervals.

**Skill.** No relation between OFPT performance and skill was found. A positive relation between openness and skill was found ( $b = 0.11$ ,  $t(55.1) = 3.23$ ,  $p = .013$ , 95% CI [0.04, 0.17]). AIAIC<sub>G</sub> was positively related to skill ( $b = 0.19$ ,  $t(51.6) = 3.65$ ,  $p = .001$ , 95% CI [0.09, 0.29]). Single-scale models showed no effects. Backward elimination also showed a negative relation between extraversion and skill, and an effect of stimulation, indicating higher skill after stimulation. Three interactions between personality and tDCS were found,

indicating that artworks from higher agreeable artists showed more skill after stimulation; artworks from more introverted artists showed more skill after stimulation; and artworks from artists with higher neuroticism showed more skill after stimulation (Figure 8, bottom panel). Also, additional effects for AIAIC were found, where self-assessed ability to imagine artworks before drawing and artistic ability were positively related to skill, and an interaction indicating that artworks from artists with higher ability to imagine artworks before drawing showed more skill after stimulation (Figure 8, top panel). Also, two interactions between SADA and tDCS were found, indicating that artworks from artists with higher confidence in mark making showed more skill after stimulation, but less skill with lower confidence, and artworks from artists with lower self-assessed realistic copying ability showed more skill after stimulation, but less skill with higher self-ratings (Figure 8, top panel).

### Figure 8

*Interactions between LFT-tDCS, SAA, and personality regarding skill in realistic drawings*

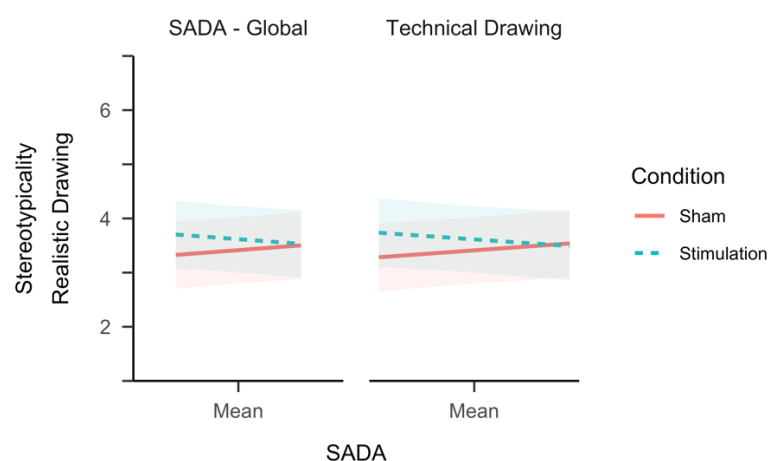


*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean. Shades represent 95% confidence intervals.

**Stereotypicality.** No relation between OFPT performance or personality and stereotypicality was found. However, an effect of stimulation in the OFPT model was found indicating higher stereotypicality after stimulation ( $b = 0.2$ ,  $t(855.8) = 2.62$ ,  $p = .018$ , 95% CI [0.05, 0.36]). AIAIC<sub>G</sub> was positively related to stereotypicality ( $b = 0.12$ ,  $t(110) = 2.36$ ,  $p = .01$ , 95% CI [0.02, 0.21]); both global SAA models showed an effect of stimulation, indicating higher stereotypicality after stimulation; and an interaction between SADA<sub>G</sub> with tDCS indicating that drawings from participants with lower SADA<sub>G</sub> were more stereotypical after stimulation ( $b = -0.18$ ,  $t(841.8) = -2.73$ ,  $p = .024$ , 95% CI [-0.32, -0.03], Figure 8, left panel). Single-scale models showed no further relations, but an effect of stimulation in the AIAIC model (see Table A14). Backward elimination also showed effects of stimulation in all models (all consistent with confirmatory results); also, self-assessed ability to imagine artworks before drawing was positively related to stereotypicality. An interaction was found, indicating that artworks from participants with lower self-assessed ability of technical drawing were more stereotypical after stimulation (Figure 9).

### Figure 9

*Interactions between LFT-tDCS and SADA regarding stereotypicality of realistic drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean. Shades represent 95% confidence intervals.

**Realism (Externally Cued).** No relation between OFPT performance, personality, or both global SAA scores and realism was found. Single-scale models showed that self-assessed ability to imagine artworks during drawing ( $b = 0.16$ ,  $t(56.2) = 2.91$ ,  $p = .018$ , 95% CI [0.05, 0.27]) and artistic ability ( $b = 0.25$ ,  $t(55.5) = 4.59$ ,  $p > .001$ , 95% CI [0.14, 0.36]) were positively related to realism. Also, an interaction was found indicating that artworks from artists with higher self-assessed ability to imagine artworks during drawing were less realistic after stimulation, but more realistic for artists with lower self-ratings ( $b = -0.3$ ,  $t(34.1) = -3.5$ ,  $p = .006$ , 95% CI [-0.46, -0.13], Figure 7, right panel). Backward elimination also showed two effects for SADA, where self-assessed ability of using contrast was positively related to realism; self-assessed technical drawing ability was negatively related to realism (Figure 7, right panel). Also, an interaction was found indicating that artworks from artists with higher self-assessed ability of using contrast were less realistic after stimulation.

**Table 12**

*Results of backward elimination for AIAIC and realistic drawing in LFT*

DV	Predictor	Estimate	SE	95 % CI		df	P <sub>adj</sub>
				LL	UL		
<b>Realism (Internally Cued)</b>							
	Intercept	2.08	0.16	1.76	2.40	19.1	<.001***
	Stimulation	0.15	0.07	0.01	0.29	27.3	.044*
	Imagination before drawing	0.07	0.03	0	0.13	55.6	.044*
	Artistic ability	0.09	0.03	0.03	0.16	58.9	.016*
<b>Skill</b>							
	Intercept	2.21	0.18	1.85	2.57	17.8	<.001***
	Stimulation	0.16	0.08	0	0.32	24.4	.059
	Imagination before drawing	0.09	0.03	0.03	0.16	58.7	.015*
	Artistic ability	0.15	0.03	0.09	0.22	52.7	<.001***
	Imagine before × Stimulation	0.12	0.05	0.02	0.22	33.2	.036*
<b>Stereotypicality</b>							
	Intercept	3.52	0.31	2.91	4.12	15.4	<.001***
	Stimulation	0.27	0.08	0.11	0.42	883.6	.001**
	Imagination before drawing	0.10	0.03	0.04	0.17	75.7	.002**
<b>Realism (Externally Cued)</b>							
	Intercept	2.41	0.21	2	2.82	21.1	<.001***
	Stimulation	-0.02	0.09	-0.20	0.16	28.2	.829
	Imagination during drawing	0.11	0.05	0.01	0.21	58.4	.045*
	Artistic ability	0.23	0.05	0.13	0.33	59	<.001***
	Imagine during × Stimulation	-0.27	0.07	-0.40	-0.14	30.4	<.001***

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; df = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table 13***Results of backward elimination for SADA and realistic drawing in LFT*

DV	Estimate	SE	95 % CI		df	p <sub>adj</sub>
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.75	2.41	20.3	<.001***
Stimulation	0.01	0.05	-0.08	0.11	884.7	.759
Drawing from observation	0.17	0.06	0.06	0.28	205.2	.007**
Using perspective and shading	0.18	0.07	0.04	0.31	137.4	.012*
Confidence in mark making	-0.04	0.04	-0.11	0.04	383.3	.409
Technical drawing	-0.11	0.04	-0.20	-0.03	198.6	.012*
Realistic copying	-0.15	0.06	-0.25	-0.04	169.5	.012*
Confidence in Marks × Stimulation	0.15	0.05	0.04	0.25	830.1	.012*
Realistic copying × Stimulation	-0.15	0.04	-0.24	-0.07	883.2	.001**
<b>Skill</b>						
Intercept	2.19	0.19	1.83	2.56	18.9	<.001***
Stimulation	0.03	0.08	-0.12	0.17	23.3	.810
Drawing from observation	0.14	0.07	0	0.27	59	.074
Using perspective and shading	0.17	0.08	0.02	0.33	56.8	.061
Confidence in mark making	0.01	0.05	-0.09	0.11	50.5	.908
Technical drawing	-0.11	0.05	-0.21	-0.01	57	.061
Realistic copying	-0.10	0.07	-0.23	0.03	58.2	.168
Confidence marks × Stimulation	0.19	0.07	0.04	0.33	34.9	.049*
Realistic copying × Stimulation	-0.18	0.06	-0.29	-0.06	31.5	.025*
<b>Stereotypicality</b>						
Intercept	3.51	0.31	2.91	4.12	15.7	<.001***
Stimulation	0.20	0.08	0.05	0.35	859.1	.012*
Technical drawing	0	0.04	-0.08	0.08	59.7	.966
Technical drawing × Stimulation	-0.17	0.06	-0.29	-0.04	830	.012*
<b>Realism (Externally Cued)</b>						
Intercept	2.44	0.22	2.00	2.87	24.9	<.001***
Stimulation	-0.10	0.09	-0.29	0.08	28.2	.286
Using contrast and tone	0.16	0.07	0.03	0.29	55.8	.034*
Technical drawing	-0.15	0.07	-0.29	-0.01	58.9	.044*
Using contrast × Stimulation	-0.17	0.07	-0.31	-0.04	28.5	.034*

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; df = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table 14***Results of backward elimination for BFI-10 and realistic drawing in LFT*

DV	Predictor	Estimate	SE	95 % CI		df	p <sub>adj</sub>
				LL	UL		
<b>Realism (Internally Cued)</b>							
	Intercept	2.08	0.17	1.75	2.42	22.1	<.001***
	Stimulation	0.10	0.05	0.01	0.19	843.3	.048*
	Extraversion	-0.01	0.03	-0.07	0.05	138.5	.731
	Agreeableness	-0.08	0.03	-0.14	-0.01	134.7	.048*
	Neuroticism	-0.07	0.03	-0.13	0	106.8	.055
	Extraversion × Stimulation	-0.06	0.03	-0.11	0	840.4	.054
<b>Skill</b>							
	Intercept	2.19	0.19	1.82	2.56	19.5	<.001***
	Stimulation	0.14	0.06	0.02	0.25	17	.042*
	Extraversion	-0.08	0.03	-0.15	-0.01	62.8	.042*
	Agreeableness	-0.02	0.03	-0.09	0.04	72.3	.481
	Neuroticism	-0.05	0.03	-0.12	0.01	60.3	.139
	Openness	0.09	0.03	0.04	0.14	185.8	.002**
	Extraversion × Stimulation	-0.10	0.03	-0.16	-0.04	825.7	.003**
	Agreeableness × Stimulation	0.07	0.03	0.01	0.13	822	.039*
	Neuroticism × Stimulation	0.11	0.03	0.04	0.17	670.9	.003**

Openness × Stimulation	-0.07	0.03	-0.13	0	733.1	.057
<b>Stereotypicality</b>						
Intercept	3.53	0.31	2.92	4.13	15.7	<.001***
Stimulation	0.20	0.08	0.04	0.35	827	.012*
<b>Realism (Externally Cued)</b>						
Intercept	2.45	0.23	2.00	2.91	26.7	<.001***
Stimulation	-0.08	0.10	-0.28	0.12	28.5	.617
Neuroticism	-0.01	0.06	-0.13	0.10	55.2	.835
Neuroticism × Stimulation	-0.13	0.06	-0.25	-0.01	29.3	.072

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

## Confirmatory results: RFT

### *Creative drawing*

Due to failure of convergence and/or singular-fit warnings REs-structure was adjusted. For judges' REs session and condition were removed from all models, except for liking, where only session was removed. For artists' REs session was removed from all models, except skill model, where condition was removed.

Results showed no effects of right anodal frontotemporal tDCS on creative drawing. Detailed results can be found in Table 15 and are visualized in Figure 10. Session effects for quality, creativity, and liking were found, where drawings of the second session received higher scores.

**Table 15**

*Confirmatory results for creative drawing in RFT*

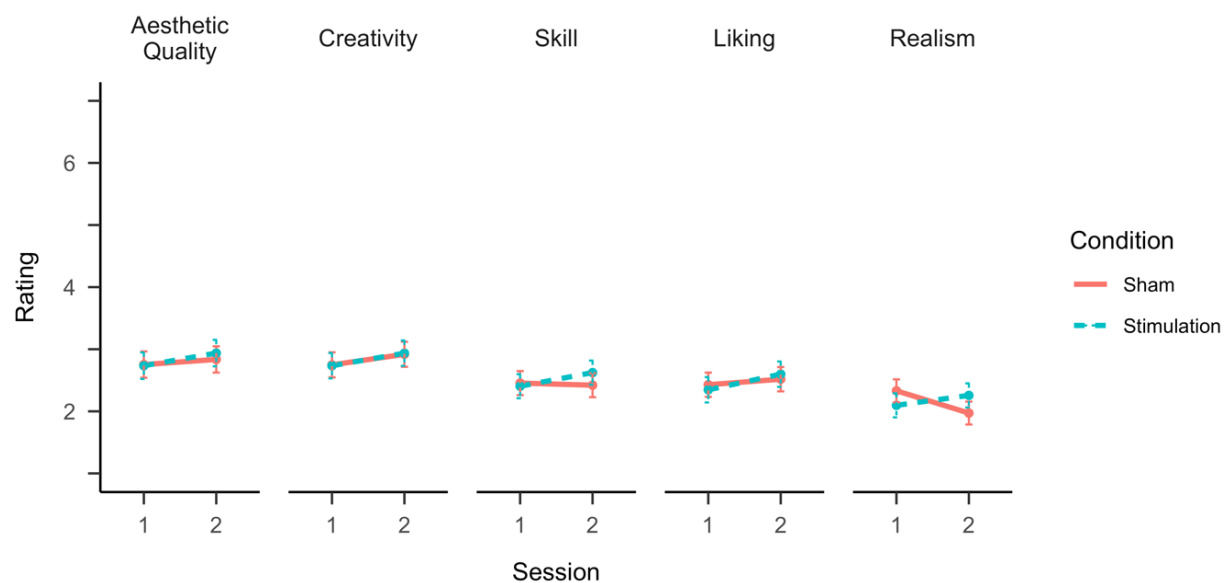
DV	Predictor	Estimate	SE	95% CI		$df$	$p_{adj}$
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.82	0.21	2.41	3.22	15.4	<.001***
	Stimulation	0.04	0.05	-0.06	0.15	90	.44
	Session	0.14	0.05	0.04	0.25	90	.02*
	Stimulation × Session	0.12	0.12	-0.12	0.36	89.1	.427
<b>Creativity</b>							
	Intercept	2.83	0.19	2.46	3.21	16.4	<.001***
	Stimulation	0	0.06	-0.12	0.13	90	.972
	Session	0.19	0.06	0.06	0.31	90	.008**
	Stimulation × Session	0.03	0.18	-0.32	0.38	89.1	.972
<b>Skill</b>							
	Intercept	2.48	0.19	2.11	2.84	16	<.001***
	Stimulation	0.08	0.05	-0.02	0.18	90	.139
	Session	0.09	0.05	-0.01	0.19	90	.123
	Stimulation × Session	0.25	0.15	-0.04	0.55	89.1	.123
<b>Liking</b>							
	Intercept	2.47	0.19	2.10	2.85	15.8	<.001***
	Stimulation	0	0.07	-0.14	0.14	27	1

Session	0.17	0.06	0.05	0.29	89.9	.013*
Stimulation × Session	0.16	0.16	-0.14	0.47	89.1	.395
<b>Realism</b>						
Intercept	2.16	0.17	1.83	2.49	19.9	<.001***
Stimulation	0.03	0.08	-0.14	0.19	90	.768
Session	-0.10	0.08	-0.27	0.07	90	.328
Stimulation × Session	0.52	0.26	0.02	1.02	89.3	.091

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Figure 10**

*Confirmatory results for creative drawing in RFT*



Note. Values depicted represent estimated marginal means which do not necessarily represent the observed means.

### ***Realistic drawing***

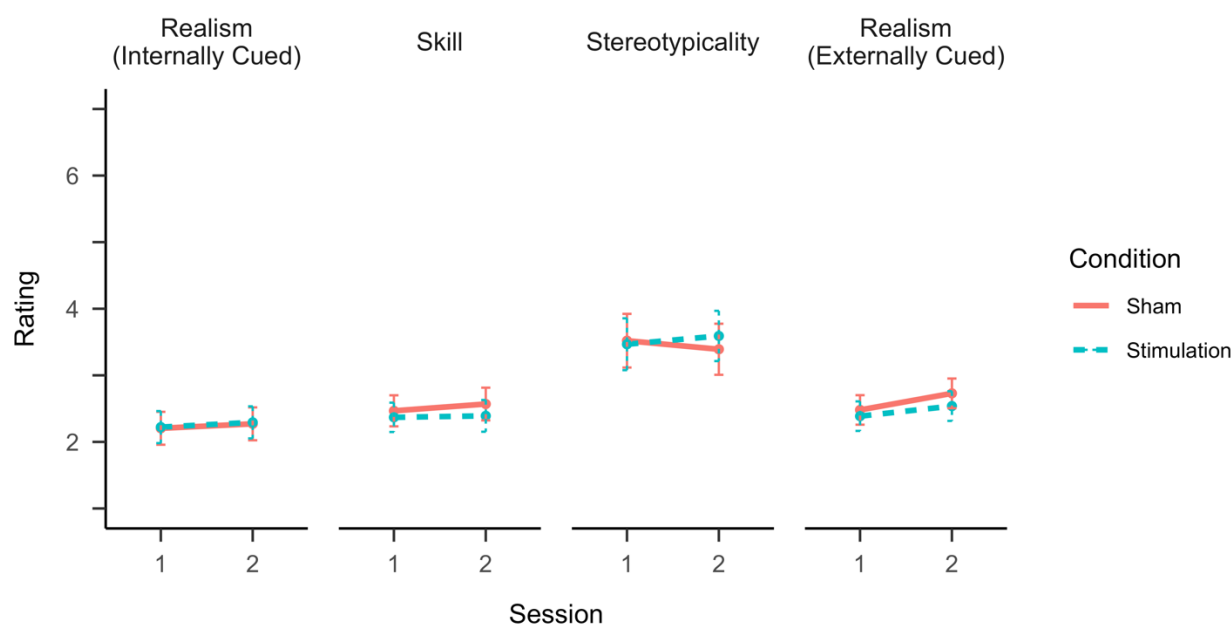
Due to singular-fit warnings, REs-structure was adjusted. For judges' REs, session and condition were removed from both realism models, condition from the stereotypicality model, and session from the skill model. For artists' REs, session was removed from the internally cued realism model and condition from the externally cued realism model.

Results showed no effects of right anodal frontotemporal tDCS on realistic drawing. Detailed results can be found in Table 16 and are visualized in Figure 11. A session effect for externally cued realistic drawing was found, where drawings of the second session received higher scores.

**Table 16***Confirmatory results for realistic drawing in RFT*

DV	Predictor	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
				LL	UL		
<b>Realism (Internally Cued)</b>							
	Intercept	2.25	0.21	1.83	2.67	23.7	<.001***
	Stimulation	0.02	0.07	-0.12	0.16	30	.992
	Session	0.07	0.07	-0.07	0.20	30	.655
	Stimulation × Session	0	0.42	-0.82	0.83	29.4	.992
<b>Skill</b>							
	Intercept	2.45	0.21	2.03	2.87	19.5	<.001***
	Stimulation	-0.14	0.08	-0.30	0.02	17.1	.213
	Session	0.06	0.07	-0.08	0.21	26.4	.54
	Stimulation × Session	-0.08	0.33	-0.72	0.56	29.5	.809
<b>Stereotypicality</b>							
	Intercept	3.49	0.36	2.78	4.21	17.4	<.001***
	Stimulation	0.07	0.11	-0.14	0.29	28.1	.749
	Session	0	0.12	-0.23	0.23	18	.985
	Stimulation × Session	0.25	0.43	-0.59	1.10	29.2	.749
<b>Realism (Externally Cued)</b>							
	Intercept	2.53	0.18	2.18	2.89	30.7	<.001***
	Stimulation	-0.14	0.08	-0.31	0.02	30	.131
	Session	0.20	0.08	0.04	0.36	30	.046*
	Stimulation × Session	-0.10	0.45	-0.99	0.79	29.6	.831

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Figure 11***Confirmatory results for realistic drawing in RFT*

Note. Values depicted represent estimated marginal means which do not necessarily represent the observed means.

**Exploratory results: RFT*****Group differences of exploratory measures in RFT***

Results of paired, two-sided *t*-tests can be found in Table 17, showing no differences of exploratory measures between experimental conditions in RFT.

**Table 17**

*Comparison of exploratory measures between conditions in RFT*

Scale	Sham		Stimulation		<i>t</i>	<i>df</i>	<i>p<sub>adj</sub></i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<b>Out of Focus Picture Task</b>	7.17	3.71	6.73	3.34	0.94	29	.593
<b>AIAIC</b>							
Global	3.64	1.03	3.81	0.85	-1	29	.593
Attention	4.77	1.25	5.07	1.34	-1.14	29	.593
Interest in art making	3.90	1.67	3.83	1.64	0.24	29	.955
Creativity	3.63	1.61	3.30	1.29	1.09	29	.593
Artistic ability	2.93	1.28	3.10	1.47	-0.96	29	.593
Imagination before drawing	2.73	1.53	3.30	1.44	-1.93	29	.588
Imagination during drawing	3.87	1.59	4.27	1.41	-1.56	29	.588
<b>SADA</b>							
Global	3.30	1.12	3.44	1.23	-0.97	29	.593
Drawing from observation	3.50	1.48	3.50	1.57	0	29	1
Using perspective and shading	3.20	1.35	3.43	1.55	-1.13	29	.593
Realistic copying	3.07	1.46	3.10	1.65	-0.17	29	.955
Technical drawing	3.23	1.38	3.70	1.53	-1.49	29	.588
Using contrast and tone	3.17	1.51	3.20	1.56	-0.17	29	.955
Confidence in mark making	3.63	1.35	3.70	1.24	-0.44	29	.946
<b>BFI-10</b>							
Agreeableness	7.03	1.63	7	1.70	0.18	29	.955
Conscientiousness	7.47	1.41	7.50	1.43	-0.12	29	.955
Extraversion	6.53	1.98	6.27	2.15	0.85	29	.620
Neuroticism	5.50	1.89	5.13	2.10	1.69	29	.588
Openness	7.33	1.75	6.83	1.80	2.14	29	.588

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

***The relation between exploratory measures and creative drawing in RFT***

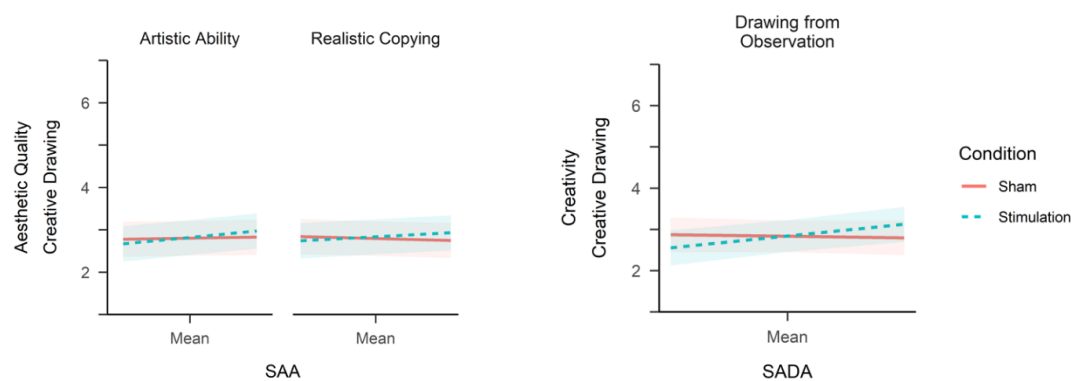
Due to singular-fit warnings, REs-structure was adjusted. For judges' REs stimulation was removed from all models except liking. Detailed statistics for models including all scales, global SAA scores, and OFPT can be found in Tables A20-A25; for backward eliminated models of SAA and personality models see in Table 18 (AIAIC), Table 19 (SADA), and Table 20 (BFI-10). Several effects were found, which in the following will be reported for each DV separately. Note, reported *p*-values were corrected following Benjamini

and Hochberg (1995) and that reported interactions with tDCS always include a comparison against sham condition.

**Aesthetic Quality.** No relation between OFPT performance, personality, or global SAA scores and quality was found. Single-scale models showed that self-assessed artistic ability was positively related to quality ( $b = 0.08$ ,  $t(140.9) = 3$ ,  $p = .022$ , 95% CI [0.03, 0.14]). Backward elimination also showed two interactions between SAA and tDCS, where artworks from artists with higher self-rated artistic ability received higher quality ratings after stimulation, but lower ratings with lower self-rated ability; where artworks from artists with higher self-rated realistic copying ability received higher quality ratings after stimulation (Figure 12, left panel).

**Figure 12**

*Interactions between RFT-tDCS and SAA regarding aesthetic quality (left panel) and creativity (right panel) of creative drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean.

**Creativity.** No relation between OFPT performance, personality, or global SAA scores and creativity was found. Single-scale models showed that self-assessed ability to imagine artworks during drawing ( $b = -0.1$ ,  $t(139.4) = -2.79$ ,  $p = .043$ , 95% CI [-0.17, -0.03]) and realistic copying ability ( $b = -0.12$ ,  $t(163.9) = -2.98$ ,  $p = .023$ , 95% CI [-0.19, -0.04]) were negatively related to creativity. Backward elimination also showed that self-assessed creativity was positively related to creativity. Also, an interaction between self-

assessed ability to draw from observation and tDCS was found, where artworks from artists with higher self-ratings were more creative after stimulation, but less creative for artists with lower self-ratings (Figure 12, right panel).

**Skill.** No relation between OFPT performance, or personality and skill was found. Both AIAIC<sub>G</sub> and SADA<sub>G</sub> were positively related to skill (AIAIC<sub>G</sub>:  $b = 0.13$ ,  $t(162.1) = 3.63$ ,  $p > .001$ , 95% CI [0.06, 0.2]; SADA<sub>G</sub>:  $b = 0.09$ ,  $t(129.4) = 2.84$ ,  $p = .01$ , 95% CI [0.03, 0.14]). Single-scale models showed that self-assessed artistic ability was positively related to skill ( $b = 0.16$ ,  $t(146) = 5.72$ ,  $p > .001$ , 95% CI [0.11, 0.22]). Backward elimination also showed that self-assessed ability to draw from observation was positively related to skill.

**Liking.** No relations between exploratory measures and liking were found.

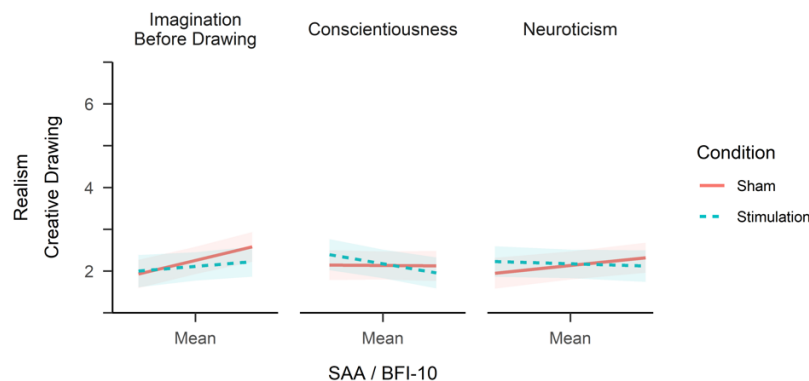
**Realism.** No relation between OFPT performance, or personality and realism was found. Both AIAIC<sub>G</sub> and SADA<sub>G</sub> were positively related to realism (AIAIC<sub>G</sub>:  $b = 0.21$ ,  $t(163.9) = 3.48$ ,  $p = .001$ , 95% CI [0.09, 0.33]; SADA<sub>G</sub>:  $b = 0.15$ ,  $t(132.7) = 3$ ,  $p = .007$ , 95% CI [0.05, 0.25]). Single-scale models showed that self-assessed artistic ability ( $b = 0.23$ ,  $t(150) = 5.13$ ,  $p > .001$ , 95% CI [0.14, 0.32]), ability to imagine artworks before drawing ( $b = 0.13$ ,  $t(139.9) = 2.68$ ,  $p = .029$ , 95% CI [0.04, 0.22]), and ability to use perspective ( $b = 0.2$ ,  $t(178.4) = 2.78$ ,  $p = .042$ , 95% CI [0.06, 0.35]) were positively related to realism whereas self-assessed creativity ( $b = -0.21$ ,  $t(135.1) = -3.62$ ,  $p = .002$ , 95% CI [-0.33, -0.1]) was negatively related to realism.

Backward elimination showed that conscientiousness was negatively related to realism. Two interactions between personality and tDCS were found, where artworks from artists with higher conscientiousness and/or neuroticism were less realistic after stimulation, but more realistic with lower self-ratings (Figure 13). Also, additional effects for SAA were found, where self-assessed technical drawing ability was negatively related to realism and an

interaction where artworks from artists with higher self-assessed ability to imagine artworks before drawing were less realistic after stimulation (Figure 13, left panel).

**Figure 13**

*Interactions between RFT-tDCS, SAA and personality regarding realism of creative drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean.

**Table 18**

*Results of backward elimination for AIAIC and creative drawing in RFT*

DV	Predictor	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.81	0.21	2.41	3.22	15.4	<.001***
	Stimulation	0.02	0.05	-0.09	0.12	90.5	.737
	Attention	0.05	0.02	0	0.09	171.1	.06
	Artistic ability	0.06	0.02	0.02	0.11	125.3	.011*
	Artistic ability × Stimulation	0.09	0.04	0.02	0.17	107.7	.034*
<b>Creativity</b>							
	Intercept	2.82	0.19	2.44	3.20	16.3	<.001***
	Stimulation	0.07	0.07	-0.06	0.20	102	.343
	Creativity	0.09	0.03	0.03	0.14	164.9	.013*
	Imagination before drawing	-0.02	0.03	-0.08	0.05	178	.64
	Imagination during drawing	-0.08	0.03	-0.15	-0.02	164.4	.029*
	Imagination before × Stimulation	0.10	0.05	0.01	0.19	125	.05
<b>Skill</b>							
	Intercept	2.47	0.19	2.11	2.84	15.6	<.001***
	Artistic ability	0.14	0.02	0.10	0.19	123.5	<.001***
<b>Liking</b>							
	Intercept	2.47	0.19	2.07	2.88	15.8	<.001***
<b>Realism</b>							
	Intercept	2.18	0.16	1.86	2.50	18	<.001***
	Stimulation	-0.14	0.09	-0.32	0.03	96.3	.115
	Creativity	-0.14	0.04	-0.22	-0.07	152.4	<.001***
	Imagination before drawing	0.15	0.04	0.07	0.22	170	<.001***
	Artistic ability	0.23	0.04	0.15	0.31	128.3	<.001***
	Imagination before × Stimulation	-0.14	0.06	-0.26	-0.02	126	.029*

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table 19***Results of backward elimination for SADA and creative drawing in RFT*

DV	Predictor	Estimate	SE	95 % CI		df	<i>p</i> <sub>adj</sub>
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.81	0.21	2.41	3.22	15.4	<.001***
	Stimulation	0.04	0.06	-0.07	0.15	89.3	.453
	Realistic copying	0.02	0.02	-0.02	0.05	114.3	.453
	Realistic copying × Stimulation	0.09	0.04	0.02	0.16	109.3	.028*
<b>Creativity</b>							
	Intercept	2.84	0.19	2.46	3.21	16.1	<.001***
	Stimulation	0.01	0.06	-0.12	0.13	85.9	.937
	Drawing from observation	0.08	0.04	0	0.17	168	.086
	Using contrast and shading	0.03	0.04	-0.06	0.11	163.3	.631
	Realistic copying	-0.11	0.03	-0.18	-0.05	132.5	.004**
	Drawing from observation × Stimulation	0.21	0.08	0.07	0.36	127.8	.013*
	Using contrast × Stimulation	-0.16	0.08	-0.31	-0.02	128.7	.057
<b>Skill</b>							
	Intercept	2.47	0.19	2.10	2.83	15.8	<.001***
	Drawing from observation	0.08	0.02	0.03	0.12	133.1	<.001***
<b>Liking</b>							
	Intercept	2.47	0.19	2.07	2.88	15.8	<.001***
<b>Realism</b>							
	Intercept	2.16	0.17	1.84	2.48	18.8	<.001***
	Using perspective and shading	0.20	0.04	0.12	0.28	144.9	<.001***
	Technical drawing	-0.12	0.04	-0.20	-0.05	178.9	.002**

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table 20***Results of backward elimination for BFI-10 and creative drawing in RFT*

DV	Predictor	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
				LL	UL		
<b>Aesthetic Quality</b>							
	Intercept	2.81	0.21	2.37	3.25	15.4	<.001***
<b>Creativity</b>							
	Intercept	2.83	0.19	2.43	3.24	16.4	<.001***
<b>Skill</b>							
	Intercept	2.47	0.19	2.11	2.84	15.9	<.001***
	Stimulation	0.08	0.05	-0.03	0.18	91.9	.186
	Agreeableness	-0.04	0.02	-0.09	0	123.4	.064
	Neuroticism	0.00	0.02	-0.03	0.04	122.3	.969
	Neuroticism × Stimulation	-0.06	0.03	-0.11	-0.01	97.3	.064
<b>Liking</b>							
	Intercept	2.47	0.19	2.07	2.88	15.8	<.001***
<b>Realism</b>							
	Intercept	2.15	0.17	1.82	2.48	20	<.001***
	Stimulation	0.04	0.08	-0.12	0.20	91.5	.617
	Conscientiousness	-0.08	0.04	-0.16	-0.01	178.2	.049*
	Neuroticism	0.03	0.03	-0.03	0.09	126.2	.346
	Conscientiousness × Stimulation	-0.15	0.06	-0.27	-0.03	116.2	.038*
	Neuroticism × Stimulation	-0.12	0.04	-0.20	-0.04	95.5	.013*

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

***The relation between exploratory measures and realistic drawing in RFT***

Due to singular-fit warnings, REs-structure was adjusted. For judges' REs stimulation was removed from all models, except for skill in all, but global, models. For artists' REs stimulation was removed from the internally cued realism model in the SADA model. Detailed statistics for models including all scales, global SAA scores, and OFPT can be found in Tables A26–A31; for backward eliminated models of SAA and personality see Table 21 (AIAIC), Table 22 (SADA), and Table 23 (BFI-10). Several effects were found, which in the following will be reported for each DV separately. Note, reported *p*-values were corrected following Benjamini and Hochberg (1995) and that reported interactions with tDCS always include a comparison against sham condition.

**Table 21***Results of backward elimination for AIAIC and realistic drawing in RFT*

DV	Predictor	Estimate	SE	95 % CI		df	<i>p</i> <sub>adj</sub>
				LL	UL		
<b>Realism (Internally Cued)</b>							
	Intercept	2.24	0.20	1.85	2.63	19.2	<.001***
	Creativity	−0.09	0.04	−0.17	−0.01	47	.025*
	Artistic ability	0.23	0.05	0.13	0.33	46.9	<.001***
<b>Skill</b>							
	Intercept	2.45	0.21	2.04	2.86	17.9	<.001***
	Stimulation	−0.16	0.06	−0.28	−0.05	866.3	.006**
	Artistic ability	0.14	0.04	0.06	0.22	80.2	.002**
<b>Stereotypicality</b>							
	Intercept	3.53	0.36	2.82	4.24	17.3	<.001***
	Stimulation	0.03	0.09	−0.15	0.21	865.2	.76
	Creativity	−0.03	0.05	−0.13	0.08	402	.76
	Imagination before drawing	0.02	0.05	−0.08	0.12	316	.76
	Artistic ability	0.15	0.07	0.02	0.28	104.8	.058
	Creativity × Stimulation	0.18	0.08	0.02	0.34	789.9	.058
	Imagination before × Stimulation	−0.15	0.08	−0.30	0	839.4	.076
<b>Realism (Externally Cued)</b>							
	Intercept	2.51	0.17	2.17	2.85	27	<.001***
	Artistic ability	0.19	0.06	0.07	0.31	50.6	.003**

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table 22***Results of backward elimination for SADA and realistic drawing in RFT*

DV	Estimate	SE	95 % CI		df	<i>p</i> <sub>adj</sub>	
			LL	UL			
<b>Realism (Internally Cued)</b>							
	Intercept	2.25	0.21	1.83	2.66	22.6	<.001***

	Stimulation	0.02	0.05	-0.08	0.12	854	.786
	Drawing from observation	0.14	0.05	0.04	0.25	529.2	.017*
	Using contrast and tone	-0.01	0.05	-0.11	0.09	505.8	.833
	Realistic copying	-0.03	0.05	-0.12	0.07	307.8	.786
	Using contrast × Stimulation	0.13	0.05	0.04	0.23	883.2	.017*
	Realistic copying × Stimulation	-0.12	0.05	-0.21	-0.03	885	.022*
<b>Skill</b>							
	Intercept	2.47	0.21	2.05	2.88	18.5	<.001***
	Drawing from observation	0.13	0.04	0.05	0.21	55.1	.003**
<b>Stereotypicality</b>							
	Intercept	3.47	0.36	2.76	4.18	17.1	<.001***
	Stimulation	0.07	0.09	-0.10	0.24	878.8	.439
	Using perspective and shading	0.14	0.06	0.03	0.26	111.4	.04*
	Technical drawing	-0.06	0.05	-0.15	0.03	408	.266
	Technical drawing × Stimulation	0.16	0.07	0.02	0.29	738.5	.044*
<b>Realism (Externally Cued)</b>							
	Intercept	2.53	0.18	2.17	2.89	31.2	<.001***
	Stimulation	-0.14	0.06	-0.25	-0.03	854.7	.027*
	Drawing from observation	0.24	0.06	0.12	0.36	545.7	<.001***
	Using contrast and tone	-0.01	0.06	-0.13	0.11	516.8	.811
	Realistic copying	-0.04	0.06	-0.15	0.07	330.1	.576
	Drawing from observation × Stimulation						
	Stimulation	-0.19	0.08	-0.35	-0.04	885.5	.027*
	Using contrast × Stimulation	0.20	0.08	0.05	0.35	883.5	.027*
	Realistic copying × Stimulation	0.12	0.06	0	0.23	881.9	.063

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table 23**

*Results of backward elimination for BFI-10 and realistic drawing in RFT*

DV	Predictor	Estimate	SE	95 % CI		<i>df</i>	<i>p</i> <sub>adj</sub>
				<i>LL</i>	<i>UL</i>		
<b>Realism (Internally Cued)</b>							
	Intercept	2.26	0.21	1.84	2.67	23.2	<.001***
	Stimulation	0.05	0.05	-0.06	0.15	885.3	.355
	Conscientiousness	-0.08	0.03	-0.15	-0.02	651.6	.025*
	Openness	0.05	0.03	-0.01	0.12	276.7	.151
	Openness × Stimulation	0.06	0.03	0	0.13	877.6	.07
<b>Skill</b>							
	Intercept	2.45	0.21	2.03	2.87	19.5	<.001***
	Stimulation	-0.14	0.06	-0.25	-0.02	856	.018*
<b>Stereotypicality</b>							
	Intercept	3.49	0.36	2.78	4.21	17.5	<.001***
	Stimulation	0.07	0.08	-0.09	0.24	856.4	.502
	Agreeableness	0.02	0.05	-0.08	0.13	84.8	.644
	Agreeableness × Stimulation	-0.14	0.05	-0.25	-0.04	877.6	.016*
<b>Realism (Externally Cued)</b>							
	Intercept	2.52	0.18	2.18	2.87	28.6	<.001***
	Openness	0.12	0.05	0.03	0.21	58.6	.012*

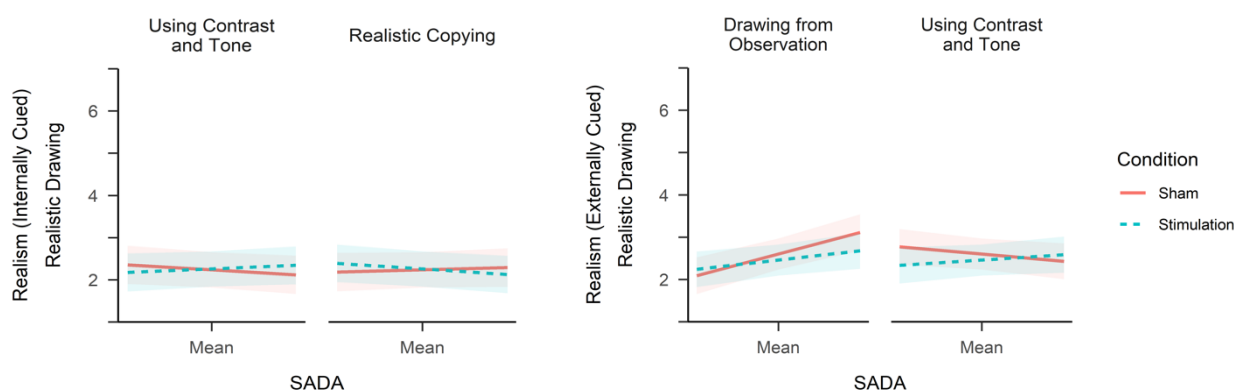
Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Realism (Internally Cued).** No relation between OFPT performance, or personality and realism was found. SADA<sub>G</sub> was positively related to realism ( $b = 0.16$ ,  $t(59) = 2.7$ ,  $p = .021$ , 95% CI [0.04, 0.29]). Single-scale models showed a positive relation between self-assessed artistic ability and realism ( $b = 0.27$ ,  $t(56.4) = 4.61$ ,  $p > .001$ , 95% CI [0.15, 0.38]).

Backward elimination showed that conscientiousness was negatively related to realism. Also, additional relations between SAA and realism were found, where self-assessed creativity was negatively, and self-assessed ability to draw from observation were positively related to realism; and an effect of stimulation in the AIAIC model was found, indicating lower realism after stimulation. Two interactions between SAA and tDCS were found, where artworks from artists with higher self-assessed ability to use contrast were more realistic after stimulation, but less realistic for artists with lower self-ratings; and where artworks from artists with lower self-assessed realistic copying ability were more realistic after stimulation, but less realistic for artists with higher self-ratings (Figure 14, left panel).

**Figure 14**

*Interactions between RFT-tDCS and SAA regarding realism of internally (left panel) or externally cued (right panel) realistic drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean.

**Skill.** No relation between OFPT performance or personality and skill was found.

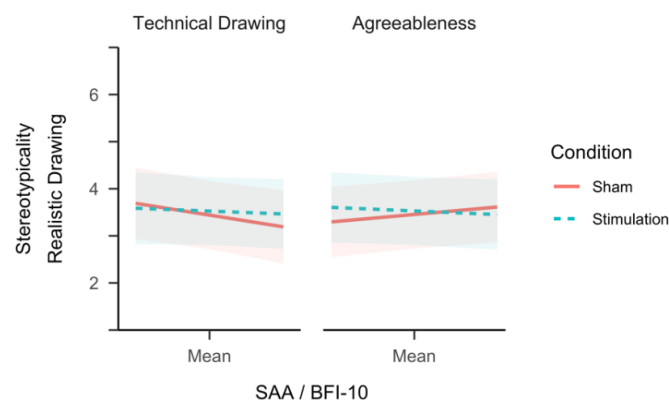
SADA<sub>G</sub> was positively related to skill ( $b = 0.15$ ,  $t(56.5) = 2.76$ ,  $p = .016$ , 95% CI [0.05, 0.26]); also, an effect of stimulation in the SADA<sub>G</sub> model was found, indicating lower skill after stimulation ( $b = -0.16$ ,  $t(30.4) = -2.33$ ,  $p = .036$ , 95% CI [-0.29, -0.03]). Single-scale models showed that self-assessed artistic ability was positively related to skill ( $b = 0.19$ ,  $t(57.2) = 3.62$ ,  $p = .004$ , 95% CI [0.09, 0.29]). Backward elimination showed two additional

effects of stimulation (AIAIC & BFI models), indicating lower skill after stimulation; and that self-assessed ability to draw from observation was positively related to skill.

**Stereotypicality.** A positive relation between OFPT performance and stereotypicality was found ( $b = 0.07$ ,  $t(53.1) = 2.68$ ,  $p = .02$ , 95% CI [0.02, 0.12]). No relation between personality, global or single SAA scales and stereotypicality was found. Backward elimination showed an interaction between personality and tDCS, where artworks from less agreeable artists were more stereotypical after stimulation, but less stereotypical for more agreeable artists (Figure 15). Also, self-assessed ability of using perspective was positively related to stereotypicality of drawings; and an interaction where artworks from artists with higher self-assessed technical drawing ability were more stereotypical after stimulation (Figure 15).

### Figure 15

*Interactions between RFT-tDCS, SAA, and personality regarding stereotypicality of realistic drawings*



*Note.* Each x-axis represents the range of one *SD* above and below the mean; for each graph not depicted variables were kept constant at mean.

**Realism (Externally Cued).** A positive relation between OFPT performance and realism was found ( $b = 0.08$ ,  $t(56.8) = 3.34$ ,  $p = .003$ , 95% CI [0.03, 0.12]). No relation between personality or global SAA scores and realism was found. Single-scale models showed that self-assessed artistic ability ( $b = 0.21$ ,  $t(57.5) = 3.17$ ,  $p = .017$ , 95% CI [0.08,

0.34]) and ability to draw from observation ( $b = 0.21$ ,  $t(41.3) = 3.14$ ,  $p = .022$ , 95% CI [0.08, 0.35]) were positively related to realism. Backward elimination also showed that openness was positively related to realism. Also, an effect of stimulation for the SADA model was found, indicating lower realism after stimulation compared to sham; and two interactions between SADA and tDCS, where artworks from artists with higher self-assessed ability to draw from observation were less realistic after stimulation; and where artworks from artists with lower self-assessed ability to use contrast were less realistic after stimulation (Figure 14, right panel). A summary of all exploratory effects can be found in Table 24.

**Table 24**

*Summary of exploratory effects found in the present study*

DV	LFT			RFT		
	Model	Scale	Direction	Model	Scale	Direction
<b>Creative Drawing</b>						
Aesthetic Quality	Full	AIAIC-G	Positive	Full	Artistic ability	Positive
		SADA-G	Positive	BE		
		Stimulation (SADA)	Negative		Artistic ability × Stimulation	Positive
		Realistic copying	Negative		Realistic copying × Stimulation	Positive
	BE	Agreeableness	Negative			
		Imagination before drawing	Positive			
		Artistic ability	Positive			
		Drawing from observation	Positive			
		Using contrast and tone	Positive			
Creativity	Full			Full		
		OFPT	Positive		Imagination during drawing	Negative
	BE				Realistic copying	Negative
		Neuroticism	Negative	BE	Creativity	Positive
				Drawing from observation × Stimulation	Positive	
Skill	Full			Full		
		Openness	Positive		AIAIC-G	Positive
		AIAIC-G	Positive		SADA-G	Positive
		SADA-G	Positive		Artistic ability	Positive
		Artistic ability	Positive	BE		
	BE	Realistic copying	Negative		Drawing from observation	Positive
		Extraversion	Negative			
		Imagination before drawing	Positive			
		Stimulation (SADA)	Negative			
		Drawing from observation	Positive			
Liking	Full					
		OFPT	Positive			
	BE	Agreeableness × Stimulation	Positive			
		Conscientiousness × Stimulation	Negative			
		Attention	Negative			
Realism						

	Full	AIAIC-G SADA-G Realistic copying	Positive Positive Negative	Full	AIAIC-G SADA-G Creativity Imagination before drawing Artistic ability Using perspective and shading	Positive Positive Negative Positive Positive Positive
	BE	Openness Neuroticism × Stimulation Openness × Stimulation Imagination before drawing Artistic ability Creativity × Stimulation Interest × Stimulation Drawing from observation Confidence marks × Stimulation Realistic copying × Stimulation	Positive Negative Positive Positive Positive Positive Negative Positive Negative Positive	BE	Conscientiousness Conscientiousness × Stimulation Neuroticism × Stimulation Imagine before × Stimulation Technical drawing	Negative Negative Negative Negative Negative
<b>Realistic Drawing</b>						
Realism (Internally Cued)						
	Full	AIAIC-G Drawing from observation Using perspective and shading Technical drawing Realistic copying	Positive Positive Positive Negative Negative	Full	SADA-G Artistic ability	Positive Positive
	BE	Stimulation (BFI) Agreeableness Stimulation (AIAIC) Imagination before drawing Artistic ability Confidence marks × Stimulation Realistic copying × Stimulation	Positive Negative Positive Positive Positive Positive Negative	BE	Conscientiousness Creativity Stimulation (AIAIC) Drawing from observation Using contrast × Stimulation Realistic copying × Stimulation	Negative Negative Negative Positive Positive Negative
Skill						
	Full	Openness AIAIC-G	Positive Positive	Full	Stimulation (SADA-G) SADA-G Artistic ability	Negative Positive Positive
	BE	Stimulation (BFI) Extraversion Extraversion × Stimulation Agreeableness × Stimulation Neuroticism × Stimulation Imagination before drawing Artistic ability Imagine before × Stimulation Confidence marks × Stimulation Realistic copying × Stimulation	Positive Negative Negative Positive Positive Positive Positive Positive Positive Negative	BE	Stimulation (BFI) Drawing from observation Stimulation (AIAIC)	Negative Positive Negative
Stereotypicality						
	Full	Stimulation (OFPT) AIAIC-G Stimulation (AIAIC-G) Stimulation (SADA-G) SADA-G × Stimulation Stimulation (AIAIC)	Positive Positive Positive Positive Negative Positive	Full	OFPT	Positive
	BE	Stimulation (BFI) Imagination before drawing Stimulation (SADA) Technical drawing × Stimulation	Positive Positive Positive Negative	BE	Agreeableness × Stimulation Using perspective and shading Technical drawing × Stimulation	Negative Positive Positive
Realism (Externally Cued)						
	Full	Imagination during drawing Artistic ability Imagination during × Stimulation	Positive Positive Negative	Full	OFPT Artistic ability Drawing from observation	Positive Positive Positive
	BE	Using contrast and tone Technical drawing Using contrast × Stimulation	Positive Negative Negative	BE	Openness Stimulation (SADA) Drawing from observation × Stimulation Using contrast × Stimulation	Positive Negative Negative Positive

*Note.* Effect ‘Direction’ indicates whether estimated effect’s value was positive or negative—in case of no interaction this indicates that higher ratings of this effect also resulted in higher ratings of the DV and vice versa; in case of interactions see at Results for interpretation. Blank rows indicate that no effects were found for this DV. ‘Full’ indicates models where all scales/variables were included; ‘BE’ indicates backward-eliminated models.

## Discussion

The main goal of the present thesis was to provide a first comprehensive and systematic insight into how frontotemporal brain regions may contribute to visual art making and whether altering their neuronal excitability via non-invasive brain stimulation can alter visual art making. Therefore, tDCS was combined with a comprehensive and standardized art making and assessing paradigm, able to provide insight into a broad set of artistic abilities of artists and included analyses to examine the veracity of the obtained dataset. In an exploratory approach, previously reported positive relations between self-assessed artistic abilities, personality, and recognizing out-of-focus pictures and actual art making abilities were investigated.

The main finding of this thesis can be summarized as showing that unilateral anodal tDCS of neither right nor left FTRs could alter visual art making abilities of healthy and artistically untrained participants but resulted in increased stereotypicality of internally cued realistic drawings after tDCS of left FTRs. Also, the used art making and assessing paradigm provided a robust ability to measure underlying artistic abilities such as creativity and technical drawing skill. Furthermore, exploratory results showed an overall positive relation between self-assessed artistic abilities and actual art making abilities, whereas no consistent relation was found for big five personality traits and recognizing out-of-focus pictures.

In the following, results will be discussed beginning with the veracity of the employed art making and assessing paradigm as this is also relevant for the subsequent discussion and understanding of confirmatory and exploratory results.

## **Veracity of art making and assessing paradigm**

### ***How to interpret veracity measures?***

Following Pelowski et al. (2019) and commonly used cutoff criteria for Cronbach's alpha, most sets of artworks on most scales would be regarded as failing to provide a stable window into artists' underlying artistic abilities. Also, the variance explained by individual artworks mostly exceeded those explained by individual artists, which was suggested as indicating a rather arbitrary nature of art products (Pelowski et al., 2019, p. 469). But does this indeed limit the veracity of the paradigm in the current study, where most sets of artworks did not represent artists' underlying artistic abilities?

A main reason why this is not necessarily the case is the growing awareness and consensus that commonly used cutoff criteria for Cronbach's alpha are rather arbitrary and misleading; also, there is no consensus on how alphas can be compared e.g., how much 'better' an alpha of 0.7 is compared to 0.68 (Cho & Kim, 2014; see also Lance et al., 2006; Taber, 2018). While high alphas are desirable—but not at all costs (see Cho & Kim, 2014)—it was emphasized that it is important that alphas are interpretable which also can be the case with lower alphas (Cronbach, 1951; Taber, 2018), to explain the intended knowledge-gain of alpha in the particular research context, and to provide complementary statistical measures supporting the interpretation of alphas (Taber, 2018).

Therefore, rather than using general cutoff criteria, the present study aimed to make alphas interpretable by considering their plausibility by comparing alphas to an informed prior i.e., known behavior of these measures in a similar context. Therefore, the means and standard deviations of veracity parameters (artwork-set & judges) reported by Pelowski et al. (2019) based on expert judges were taken as 'priors', i.e., as simple estimates of expectable alphas; a comparison between averaged veracity indicators can be found in Table A32. High

negative deviations from these priors thereby would indicate a limited veracity, whereas this may not be the case for positive deviations. Note, high deviations in the current study were defined as  $\geq 3$  SDs (of each prior), which however represents a rather arbitrary, and preliminary choice.

**Agreement between artists' artworks.** Alphas, for the agreement between artists' artworks overall were comparable to the prior, suggesting a plausible and robust ability of the paradigm to assess artists' underlying artistic abilities based on a sample of three artworks. High negative deviations were found for aesthetic quality and liking after stimulation in LFT and sham condition in RFT. However, aesthetic quality and liking represent rather subjective assessment factors and therefore artworks may indeed show higher deviations or disagreements, especially when judged by expert judges who tend to be more idiosyncratic compared to novice judges (Rostan et al., 2002).

Interestingly, no high deviations were observed when alphas were based on all artworks produced by artists suggesting that doubling the sample size in the current paradigm may indeed can enhance robustness of datasets, at least for aesthetic quality and liking. Therefore, future studies, especially when focusing on subjective scales such as liking or aesthetic quality, should consider increasing the number of artworks produced by an artist to improve the robustness of datasets. However, it should be noted that interpreting alphas based on the entire set of artworks (i.e., from both conditions) should take into account the possible effects of tDCS, task repetition, or that alphas generally tend to increase with increasing number of items (e.g., Taber, 2018).

Also, artwork-set agreement was considerably lower for creativity and realism after stimulation in LFT, and considerably higher for skill in RFT, compared to sham conditions. Speculatively, this may suggest a certain sensitivity of these skills to tDCS, but not sufficient

or strong enough for being detectable in confirmatory analysis, or possibly affecting participants differently, perhaps canceling each other out. No other notable differences between experimental conditions were observed.

**Agreement between judges.** Alphas, for the agreement between judges, overall were comparable to the prior which suggests a shared robust understanding of the provided assessment factors. High negative deviations thereby were found for liking, and aesthetic quality (only in RFT sham condition) i.e., only for subjective assessment factors, which is consistent with artwork-set alphas and high idiosyncrasy of expert judges (Rostan et al., 2002). Therefore, not considering liking and aesthetic quality—due to their subjectivity—no notable differences between experimental conditions in both groups were found. Alphas based on ratings of single artworks overall were lower but appeared to be more robust—compared to averaged ratings—in case of greater variability of ratings in subjective scales, as was observed between conditions in RFT.

**Variance component analysis.** Variance explained by individual artists overall (also based on artworks from both conditions) was lower than explained by individual artworks, with the only exception of LFT sham condition. Following Pelowski et al. (2019) this would suggest that most artwork-sets represented unstable datasets, only providing low ability to measure artists' underlying artistic abilities. Although these results indeed indicate a rather heterogeneous and complex dataset, analysis methods such as LMEMs are very well able to analyze such datasets appropriately, allowing to derive meaningful results, for example, by adjusting random effects, as was done in the present study.

Interestingly, variance explained by individual artists relative to artworks for creativity, and realism was lower after tDCS in both groups, and higher for skill after stimulation in RFT. This seems consistent with results for artwork-set agreement, and,

speculatively, indicates that creativity and realism of creative artworks were sensitive to anodal tDCS of (left) FTRs, whereas technical drawing skill to tDCS of right FTRs. Also, veracity indicators for realism in the present study were considerably higher than those reported by Pelowski et al. (2019), where it was argued that low ratios possibly were due to not explicitly instructing participants to make realistic drawings, and where participants only chose to do so sporadically. As this also was true for the present study, we have no intuitive explanation for these differences. However, it should be noted that realism of creative drawings likely was dependent on an interaction between choice and ability to draw realistically, and thus results should be interpreted with care.

Overall, the results of the veracity analyses were comparable to those reported by Pelowski et al. (2019) and therefore indicate a certain robustness of the used art making and assessing paradigm to measure two key factors of art quality, namely technical drawing skill and creativity, but also the realism of artworks. However, results also showed that more subjective scales such as personal liking or aesthetic quality in combination with expert judges can result in heterogenous and unstable datasets, but may be addressed by increasing the number of artworks per artist or adequate analysis. The employed veracity analyses provided a valuable source of information about the current sample of artists, artworks, and judges and future research should consider also employing these analyses. Another interesting path for future research would be to test the current art making and assessing paradigm with professional artists. This may be relevant as some judges in the present study complained about the overall poor quality of drawings, which some described as childish scribbles that may not have been taken too seriously.

Also, more session effects in RFT compared to LFT were found—all indicating higher ratings of drawing produced in the second session—which is consistent with a shorter average time between sessions in RFT compared to LFT and thus likely represent training

effects. Future research therefore should keep time between sessions constant, probably not undercutting 3 days to maximize comparability.

### **Can tDCS alter visual artistic abilities?**

The present thesis' main finding is that unilateral anodal tDCS of neither left nor right frontotemporal regions (20 min, 2 mA) could not alter visual artistic abilities on a comprehensive set of visual art making tasks. However, results showed that tDCS of left FTRs resulted in increased stereotypicality of internally cued realistic drawings compared to sham. This may be in line with research associating left FTRs with storing mental templates/representations and controlled semantic memory retrieval (Chi & Snyder, 2011; Grindrod et al., 2008). Enhanced neuronal excitability of left FTRs therefore may have facilitated access to stereotypical mental templates, and speculatively, the maintenance or induction of a less creative, but economic, routine-based cognitive state (see Lucchiari et al., 2018). This is also consistent with findings showing that anodal stimulation of the left IFG resulted in more appropriate, but less novel responses in a uncommon sentence completion task (Kenett et al., 2021; Y. Li et al., 2022 for review). However, increased stereotypicality after left anodal frontotemporal tDCS may be not consistent with reports of increased stereotypicality in artistic FTD patients with dominant left frontotemporal brain damage (e.g., de Souza et al., 2014; Thomas Antérion et al., 2002).

The overall lack of effects found in the present thesis showed that mere enhancement of neuronal excitability of FTRs is not sufficient to alter visual artistic abilities. Together with previous findings, this may further suggest that neither functional loss nor gain alone, but rather a combination of both may be necessary to sufficiently alter VAAs. More concretely, an artificial enhancement of artistic abilities may require a decrease of inhibitory control exerted by left FTRs as well as enhanced functionality of other brain regions such as contralateral FTRs, or possibly temporoparietal regions in line with observed brain changes

in FTD (see Friedberg et al., 2022; Geser et al., 2021; Miller et al., 1996; Popal et al., 2020; Seeley et al., 2008).

However, as research has shown that unilateral anodal tDCS of FTRs could alter some aspects of creativity (Y. Li et al., 2022 for review), another possibility is that potential creativity-altering effects of tDCS were lost in the translation from a mental to a physical representation. This may be supported by the notion that drawing skill likely facilitates creativity in visual art (Acosta, 2014; Amabile, 1983; Chan & Zhao, 2010; Kozbelt, 2004) and would insinuate that most people can neither draw what they see, nor what they imagine. Future research therefore may follow up on this idea by combining different measures of creativity with NIBS.

### **Limitations of used tDCS protocol**

tDCS still is a poorly understood method where many factors such as intensity, duration, electrode characteristics and placement or interindividual differences such as brain anatomy, functional organization of local circuits, baseline neurophysiological state, or gender may affect the effect of tDCS (Batsikadze et al., 2013; Esmaeilpour et al., 2018; Fertonani & Miniussi, 2017; Mosayebi Samani et al., 2019; Weinberger et al., 2017; Weller et al., 2020).

Therefore, the choice of stimulation parameters, montage or sample used in the present study may have contributed to the lack of findings. For example, while unilateral stimulation aimed to explore potential hemispheric differences in visual art making, the lack of findings in the present study are consistent with the suggested superiority of bilateral compared to unilateral montages in producing creativity-related effects (Y. Li et al., 2022 for review). This again suggests that an effective alteration of artistic abilities may require both, reduced inhibitory control of left FTRs and functional increases in other, yet-to-be

determined brain regions. Research has also shown that increasing stimulation parameters does not necessarily result in higher effectiveness where e.g., none or even reversed effects—compared to lower intensities—were often found in experiments where tDCS with 2 mA for around 20 min was applied, i.e., the same setup as was used in the current study (Batsikadze et al., 2013; Mosayebi-Samani et al., 2020; Mosayebi Samani et al., 2019; Weller et al., 2020).

This possible non-linearity of tDCS effects may also have affected the cephalic reference electrode, which was placed over contralateral supraorbital areas, a commonly used montage for unilateral stimulation (e.g., Cattaneo et al., 2014; Jacobson et al., 2011; Nitsche et al., 2008). However, while unilateral stimulation was intended, evidence showed that cathodal stimulation of supraorbital regions with 2 mA actually targeted—likely having excitatory rather than inhibitory effects—a key node of the limbic system network, (Soleimani et al., 2021), the middle prefrontal gyrus (De Witte et al., 2018), or reduced mind wandering, but only in men (Bertossi et al., 2017). Consistent with this, it was argued that extracephalic reference electrodes may be preferable to cephalic ones, in order to minimize possibly confounding effects (Bertossi et al., 2017; but see Moliadze et al., 2010). Thus, it is possible that the tDCS montage used in addition of specifically targeting FTRs, also enhanced neuronal excitability in contralateral supraorbital, limbic and/or frontal brain regions. Such a broad and unspecific increase in neuronal excitability within both hemispheres would therefore be unlikely to result in specific effects regarding visual artistic abilities and thus explain the lack of findings in the present study.

Also, the fact that tDCS effects of a similar montage were only found in male participants may also explain the overall lack of findings in the present study, as almost 75% of the sample consisted of female participants (Bertossi et al., 2017; Fertoni & Miniussi, 2017 for review). Further support for the importance of interindividual differences may come

from exploratory LMEMs of the current study, including information on individuals' self-assessed artistic abilities or personality and indeed showed some effects of tDCS. Also, veracity analyses indicated differences in the drivers of variance of individual artwork ratings between experimental conditions, possibly suggesting some effect of tDCS, perhaps affecting individuals differently. Although these results should not be considered as robust evidence, these observed effects may be informative for future research and overall provide weak indications that artistic abilities may be indeed sensitive to anodal tDCS of FTRs.

To further investigate the possibility of altering VAAs via tDCS, future research should employ bilateral montages, or possibly use an extracephalic reference electrode, and consider stimulation intensities below 2 mA. An intriguing avenue here would be testing different montages and intensities, or the employment of high definition tDCS, which allows a more precise targeting of regions of interest (e.g., Kuo et al., 2013; Masina et al., 2021). Also, the present study did not employ any manipulation checks which would enable to make a conclusion about whether the lack of findings was due to insufficient or deviant-from-expected stimulation, or whether the intended stimulation indeed failed to produce hypothesized effects. Thus, future research should employ manipulation checks probably using physiological measures (e.g., EEG or fMRI), which would also allow to study actual physiological effects of NIBS or other creativity tasks.

### **The relation between exploratory measures and visual artistic abilities**

In an exploratory approach the current thesis also explored the relation between self-assessed artistic abilities, personality, recognizing out-of-focus pictures and visual art making abilities, and whether these measures or their relation to art making might be affected by tDCS; a summary of all exploratory effects can be found in Table 24.

**Out-of-focus picture recognition**

The present study found no consistent relation between performance on the OFPT and visual art making abilities. Adding up to mixed findings, higher performance on the OFPT was positively associated with realistic copying in RFT (Kozbelt, 2001; Pelowski et al., 2019), but not in LFT (see Chamberlain et al., 2019). Also, in contrast to the study of Pelowski et al. (2019), no positive relation between OFPT performance and art quality i.e., (aesthetic quality or technical skill) was found. Also, no effect of tDCS on OFPT-performance was found.

**Big Five personality**

The present study found few, inconsistent, and rather small effects indicating relations between big five personality traits and artistic abilities, and only in part replicated previous findings. Consistent with previous findings, openness was positively associated with artistic abilities such as realistic copying ability in RFT, or technical drawing skill in LFT (e.g., Fayn et al., 2015; Feist, 1998; Pelowski et al., 2019). In contrast to previous findings, the present study did not find a positive relation between extraversion and artistic abilities (e.g., realistic copying, see Pelowski et al., 2019); however, an even a negative relation between extraversion and technical drawing skill was found in LFT. Interestingly, this negative relation in LFT was modulated by tDCS, where participants with lower extraversion (i.e., introverts) received higher skill ratings after stimulation compared to sham. This is consistent with findings showing that tDCS effects were more pronounced in persons with lower approach motivation and/or extraversion i.e., introverts (e.g., Metuki et al., 2012; Peña-Gómez et al., 2011; Reyes et al., 2021).

Additional effects of Big Five personality traits were found, overall indicating a negative relation with visual artistic abilities, which in part also were affected by tDCS. Interestingly, a consistent interaction between neuroticism and tDCS was found in both

groups, where creative artworks from artists with lower neuroticism were more realistic after tDCS compared to sham, whereas they were less realistic for artists with higher neuroticism. Speculatively, this might show that the choice or ability to draw a realistic motif is modulated by an interaction of neuroticism and neuronal excitability of FTRs, which may be addressed by future research. Although no robust and consistent relations were found between the Big Five personality traits and visual art making abilities, the present results highlight the importance of considering the potential moderating role of interindividual personality differences on tDCS effects.

### **Self-assessed artistic abilities**

The present study found consistent and robust effects indicating that self-assessed artistic abilities overall corresponded to actual visual art making abilities as rated by expert judges, which is consistent with previous findings (Chamberlain et al., 2013; McManus et al., 2010; Pelowski et al., 2019). Results showed that average scores of the two used instruments were positively associated with technical drawing skill, and aesthetic quality of creative drawings (only for AIAIC in RFT). Backward elimination of models including all scales consistently identified self-rated ability of drawing from observation, for SADA, and self-rated artistic ability, for AIAIC as main drivers of this relation (see Table 24).

In contrast to previous findings, the global SADA score (and also AIAIC) was not positively related to realistic copying ability (Chamberlain et al., 2013; McManus et al., 2010; Pelowski et al., 2019). While both global SAA scores did not show a consistent relation to internally cued realistic drawing, self-rated artistic ability (realism, skill) and ability to draw from observation (realism) did. Overall, these findings are consistent with previous ones indicating a positive relation to realistic drawing skills, but represented no exact replication (Chamberlain et al., 2013; McManus et al., 2010; Pelowski et al., 2019).

The present study also investigated whether and how anodal tDCS would affect the relation between self-rated artistic abilities and actual art making abilities. Several interactions were found, which overall presented a heterogeneous picture and mostly were not consistent between or within experimental groups (see Table 24). Interestingly, most interactions with tDCS were found in the context of realistic drawing in LFT which, speculatively, may show that realistic drawing abilities are more sensitive to enhanced neuronal excitability of left FTRs.

For example, results showed that in both groups, artists with lower self-rated realistic copying ability could produce more realistic internally cued drawings after tDCS, whereas artists with higher self-ratings drew less realistic internally cued drawings after stimulation. This may suggest that general enhanced neuronal excitability of FTRs, perhaps resulting in enhanced cognitive/inhibitory control, is beneficial for internally cued drawing for less talented artists, but detrimental for more talented artists. However, it is important to highlight that overall tDCS effects found were rather small and should therefore be interpreted carefully, but rather highlight that even in a homogeneous sample of untrained students, interindividual differences in self-rated artistic abilities can influence the effect of tDCS.

## **Conclusion**

The present thesis showed that unilateral anodal tDCS of frontotemporal brain regions could not alter visual art making abilities in healthy, artistically untrained participants, but resulted in increased stereotypicality of internally cued realistic drawings after left FT-tDCS. The tDCS montage and parameters used therefore likely contributed to the current lack of findings, suggesting that future research should consider using bilateral tDCS montages and lower stimulation intensities. The used art making and assessing paradigm overall showed a robust ability to measure key factors of art quality, namely technical drawing skill, and creativity, but also realism of artworks and therefore should be used by future research.

Exploratory results showed an overall positive relation between self-assessed artistic abilities and actual art making abilities, whereas no consistent relation was found for big five personality traits and recognizing out-of-focus pictures. Furthermore, exploratory analyses showed that even in a homogeneous sample of artistically untrained students, interindividual differences in personality or artistic ability can influence the effect of tDCS.

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## Appendix

### Abstract – German

Fallstudien der letzten zwei Jahrzehnte haben vermehrt das spontane Auftreten von künstlerischen Fähigkeiten, insbesondere der Fähigkeit zum realistischen Zeichnen, mit Frontotemporal Demenz assoziiert. Dies hat wissenschaftliches Interesse zur Frage geweckt, ob eine künstliche Veränderung der Gehirnaktivität in frontotemporalen Regionen (FTR), auch in gesunden Personen künstlerischen Fähigkeiten verändern kann. Einige wenige Studien haben diese Idee mit der Hilfe von nicht-invasiver Gehirnstimulation getestet und in der Tat veränderte künstlerische Fähigkeiten in einigen wenigen Personen festgestellt, jedoch nur unter limitierenden Umständen wie zum Beispiel das Fehlen von standardisierten Methoden zur Kunstherstellung und Bewertung. Das Ausbleiben von Nachforschungen bezüglich dieser interessanten, aber limitierten Resultate lässt bis dato die Frage offen ob nicht-invasive Gehirnstimulation von FTRs in der Tat künstlerische Fähigkeiten verändern kann. Um diese Forschungslücke zu schließen, wurde ein Experiment durchgeführt in welchem entweder linke oder rechte FTR von VersuchsteilnehmerInnen mit anodaler transkranieller Gleichstrom Stimulation (tDCS) stimuliert wurden, und in welchem ein kürzlich vorgestelltes standardisiertes und umfassendes Protokoll zur Kunstherstellung und Bewertung eingesetzt wurde. In einem explorativen Ansatz wurde die Beziehung zwischen selbst eingeschätzten künstlerischen Fähigkeiten, Persönlichkeit, perzeptuellen Fähigkeiten und tatsächlichen künstlerischen Fähigkeiten untersucht. Resultate zeigten keinen Effekt von tDCS auf künstlerische Fähigkeiten, aber eine gesteigerte stereotype Darstellung von realistischen Zeichnungen nach Stimulation von linken FTR. Analysen zeigten, dass das eingesetzte Protokoll einen robusten Einblick in künstlerische Fähigkeiten der KünstlerInnen ermöglichte. Explorative Resultate konnten nur in Teilen vorangegangene Berichte replizieren, aber zeigten, dass selbst in einer homogenen Stichprobe, interindividuelle

Unterschiede die Effekte von tDCS beeinflussen können. Limitationen und Richtungen für zukünftige Forschungen werden diskutiert.

**Table A1***Reported artistic FTD patients and observed neurophysiological measures*

#	Authors / ID	Diagnosis	Atrophy reported	Dominance / Region		Perfusion reported	Dominance / Region	
1	<b>Miller et al. (1996)</b> BM	FTLD (FTD)	bitemporal	n.d.	temporal	Hypo: bilateral temporal (right > l)	right	temporal
2	<b>Edwards-Lee et al. (1997)</b> LTLV 5		small WM lesions	n.d.		bitemporal and orbito-frontal (sl left > r)	left	orbitofrontal
3	<b>Miller et al. (1998)</b> Pt. 1	FTD-MND	n.r.			bitemporal (left > right); mild left frontal	left	frontotemporal
4	Pt. 2	FTD	sever both inferior temporal gyri; mild frontal; little posterior*	n.d.		n.r.		
5	Pt. 4	FTD	moderate left + mild right frontal; slight left temporal	left	frontotemporal	n.r.		
6	<b>Thomas Antérion et al. (2002)</b> FTD		frontotemporal	n.d.		frontal	n.d.	
7	<b>Kleiner-Fisman et al. (2003)</b> CBD		generalized; dominant on right;	right		right hemisphere; left frontal lobe	mixed	
8	<b>Mendez &amp; Perryman (2003)</b> 1	bvFTD	frontotemporal	n.d.		bifrontal; right temporal	right	temporal
9	2	bvFTD	normal			bifrontal; right temporal	right	temporal
10	3	bvFTD	frontotemporal	n.d.		frontal; right anterior temporal	right	anterotemporal
11	4	FTD	frontotemporal	n.d.		bifrontal; bitemporal	n.d.	
12	<b>Mell et al. (2003)</b> nfvPPA		moderate bifrontal slightly left > right; mild left temporal	left	frontotemporal	n.r.		
13	<b>Chatterjee (2004) / Franklin et al. (1992)</b> MH	FTD (svPPA**)	Lesions along perisylvian cortex; assumingly: frontal, parietal, temporal, and insula	left		n.r.		
14	<b>Serrano et al. (2005)</b> 3	FTD	n.r.			left fronto-temporoparietal	left	fronto-temporoparietal
15	2	PPA	diffuse cortical	left				
16	<b>Drago et al. (2006)</b> svPPA		bilateral anterior temporal	n.d.		n.r.		
17	<b>Budrys et al. (2007)</b>		bilateral (left>right) frontal and temporal and caudate nucleus	left	frontotemporal; caudate nucleus	n.r.		
18	<b>Finney &amp; Heilman (2007)</b> nfvPPA		generalized; focal left anterior temporal and left insula	left	anterotemporal; insula	n.r.		
19	<b>Seeley et al. (2008)</b> AA	PPA-CBD	left inferolateral frontal; frontal	left	inferior frontal-insular,	left frontal	left	frontal

			insula & striatum (left > r); left anterior hippocampus & left thalamus;		temporal, and striatal;			
	<b>Midorikawa et al. (2008)</b>							
20	1	svPPA	left temporal	left	temporal			n.r.
21	2	svPPA	left temporal	left	temporal			n.r.
	<b>Liu et al. (2009)</b>							
22		FTLD (SD; ALS)	insula; anterior temporal; amygdala (left > r); other: left middle & inferior frontal gyri; left post. Thalamus; bilateral superior temporal gyri; right temporal pole	left	insula; anterior temporal; amygdala			n.r.
	<b>Kearney et al. (2012)</b>							
23		svPPA	frontotemporal; left anterior temporal	left	anterotemporal	frontotemporal & parietal (left > r)	left	frontotemporal and parietal
	<b>de Souza et al. (2014)</b>							
24			bilateral temporopolar; mild fronto polar;	n.d.				n.r.
	<b>Erkkinen et al. (2018)</b>							
25	Pt. 2	FTD	frontal cortical (r > l);	right	frontal			n.r.

*Note.* “n.d.” for no dominance; “n.r.” for not reported; “Pt.” for Patient; dominance based upon any indication given in original papers e.g., “slightly worse on the right” or “left > right” and thus does not provide any indication of quality of dominance and thus represents the interpretation of original authors; “Diagnosis” is derived from the most recent review including the case as nomenclature changed over the time and thus original reports might not represent the state of the art diagnosis; \* represents an autopsy report i.e., postmortem; \*\* assumed svPPA, see Pelowski et al. (2022)

## Neuropathology of the main variants of FTD

### *bvFTD*

Anatomically bvFTD is associated regions are rather inconsistent but typically involves frontomedial areas and sometimes even is referred as mainly frontal disease (Meyer et al., 2017); atrophies affect the paracingulate cortex, anterior insular cortex (AIC) and anterior cingulate cortex (ACC); the latter two are discussed being the epicenter of the disease and show damage even before most patients fulfill diagnosis criteria for bvFTD (Peet et al., 2021, p. 734). Other reported regions include the basal ganglia (striatum); amygdala, hippocampus, (anterior) temporal lobes or thalamus (Kamalian et al., 2022; Meeter et al., 2017; Meyer et al., 2017; Peet et al., 2021).

### *svPPA*

Anatomically svPPA is associated with asymmetric atrophy—commonly left greater than right—in the anterior temporal lobes involving lateral, inferior and medial regions

(Bisenius et al., 2016; Ezzo et al., 2020; Gorno-Tempini et al., 2011; Meeter et al., 2017; Spinelli et al., 2017). Other reported regions include the orbitofrontal cortex (OFC); medial prefrontal cortex; ACC; insula; or basal ganglia (Bisenius et al., 2016; Peet et al., 2021; Spinelli et al., 2017).

### *nfvPPA*

Anatomically *nfvPPA* is associated with atrophy in the left inferior frontal gyrus (IFG)—specifically the pars opercularis and the premotor cortex which are considered the epicenter of the variant by some (e.g. Mandelli et al., 2016; Tee & Gorno-Tempini, 2019). Other reported regions include prefrontal regions of the superior and middle frontal gyri; the precentral gyrus (supplementary motor areas); also medial temporal lobe regions and subcortical regions such as insula or basal ganglia (Bisenius et al., 2016; Mandelli et al., 2016; Spinelli et al., 2017; Tee & Gorno-Tempini, 2019; Tetzloff et al., 2018). Note a third variant of PPA can also be discriminated—logopenic variant (*lvPPA*) which however is associated with underlying AD pathology rather than FTLN (Roytman & Chiang, 2022).

### **Table A2**

Additional measures taken at end of second session

Instrument	Reference
16 Item Need for Cognitive Closure (16-NCCS)	Schlink & Walther (2007)
Art training and number of hours spent in an average week making visual art	Chatterjee et al. (2010)
Cognitive style, object-spatial imagery—The Object-Spatial Imagery and Verbal Questionnaire (QSIVQ)	Blazhenkova & Kozhevnikov (2009)
Creative Personality Scale (CPS)	Kaufman & Baer (2004)
Creativity Scale for Diverse Domains (CSDD)	Kaufman & Baer (2004)
Creative Achievement Questionnaire, Visual Arts (CAQ-VA)	Carson et al. (2005)

### **Table A3**

Descriptive statistics of artwork ratings

LFT Scale	Sham		Stimulation	
	Mean	SD	Mean	SD
Creative Drawing				
Aesthetic Quality	2.86	1.22	2.76	1.21
Creativity	2.78	1.23	2.75	1.18
Realism	2.09	1.05	2.03	1.04
Liking	2.54	1.43	2.46	1.39

Skill	2.56	1.25	2.49	1.22
Realistic Drawing				
Realism (Internally Cued)	2.03	0.96	2.13	1.01
Skill	2.15	1.02	2.24	1.11
Stereotypicality	3.42	1.67	3.62	1.68
Realism (Externally Cued)	2.47	1.32	2.40	1.25
<b>RFT</b>				
		<b>Sham</b>	<b>Stimulation</b>	
		Mean	Mean	SD
Creative Drawing				
Aesthetic Quality	2.79	1.30	2.84	1.32
Creativity	2.83	1.30	2.84	1.32
Realism	2.15	1.24	2.18	1.30
Liking	2.47	1.46	2.47	1.43
Skill	2.44	1.17	2.51	1.26
Realistic Drawing				
Realism (Internally Cued)	2.24	1.19	2.26	1.18
Skill	2.52	1.26	2.38	1.20
Stereotypicality	3.46	1.90	3.53	1.94
Realism (Externally Cued)	2.60	1.20	2.46	1.20

**Table A4***Item correlations of CIAI in LFT*

	Creativity	Interest	Attention	Imagine Before	Imagine During	Artistic Ability
<b>Total</b>						
Creativity	1	0.60	0.24	0.27	0.38	0.54
Interest in art making	0.60	1	0.20	0.38	0.46	0.50
Attention	0.24	0.20	1	0.05	0.12	-0.09
Imagine before	0.27	0.38	0.05	1	0.57	0.19
Imagine during	0.38	0.46	0.12	0.57	1	0.32
Artistic ability	0.54	0.50	-0.09	0.19	0.32	1
<b>Stimulation</b>						
Creativity	1	0.55	0.21	0.30	0.55	0.60
Interest in art making	0.55	1	0.30	0.49	0.64	0.57
Attention	0.21	0.30	1	0.05	0.25	-0.03
Imagine before	0.30	0.49	0.05	1	0.60	0.19
Imagine during	0.55	0.64	0.25	0.60	1	0.36
Artistic ability	0.60	0.57	-0.03	0.19	0.36	1
<b>Sham</b>						
Creativity	1	0.66	0.25	0.27	0.21	0.49
Interest in art making	0.66	1	0.12	0.28	0.20	0.42
Attention	0.25	0.12	1	0.08	0	-0.14
Imagine before	0.27	0.28	0.08	1	0.56	0.20
Imagine during	0.21	0.20	0	0.56	1	0.27
Artistic ability	0.49	0.42	-0.14	0.20	0.27	1

**Table A5***Item correlations of CIAI in RFT*

	Creativity	Interest	Attention	Imagine Before	Imagine During	Artistic Ability
<b>Global</b>						
Creativity	1	0.62	0.20	0.42	0.41	0.45
Interest in art making	0.62	1	0.14	0.15	0.24	0.43
Attention	0.20	0.14	1	0.11	0.12	-0.22
Imagine before	0.42	0.15	0.11	1	0.58	0.30
Imagine during	0.41	0.24	0.12	0.58	1	0.27
Artistic ability	0.45	0.43	-0.22	0.30	0.27	1
<b>Stimulation</b>						

Creativity	1	0.63	0.31	0.49	0.26	0.37
Interest in art making	0.63	1	0.12	-0.02	0.12	0.41
Attention	0.31	0.12	1	0.08	0.05	-0.27
Imagine before	0.49	-0.02	0.08	1	0.57	0.16
Imagine during	0.26	0.12	0.05	0.57	1	0.05
Artistic ability	0.37	0.41	-0.27	0.16	0.05	1
<b>Sham</b>						
Creativity	1	0.63	0.14	0.44	0.56	0.57
Interest in art making	0.63	1	0.17	0.31	0.36	0.46
Attention	0.14	0.17	1	0.11	0.16	-0.18
Imagine before	0.44	0.31	0.11	1	0.58	0.45
Imagine during	0.56	0.36	0.16	0.58	1	0.48
Artistic ability	0.57	0.46	-0.18	0.45	0.48	1

**Table A6***Item correlations of SADA in LFT*

	Drawing from observation	Using perspective	Confidence marks	Using contrast	Technical drawing	Realistic copying
<b>Global</b>						
Drawing from observation	1	0.73	0.60	0.75	0.27	0.78
Using perspective	0.73	1	0.73	0.86	0.49	0.77
Confidence marks	0.60	0.73	1	0.74	0.39	0.61
Using contrast	0.75	0.86	0.74	1	0.27	0.73
Technical drawing	0.27	0.49	0.39	0.27	1	0.25
Realistic copying	0.78	0.77	0.61	0.73	0.25	1
<b>Stimulation</b>						
Drawing from observation	1	0.69	0.58	0.74	0.09	0.77
Using perspective	0.69	1	0.67	0.82	0.43	0.75
Confidence marks	0.58	0.67	1	0.64	0.16	0.45
Using contrast	0.74	0.82	0.64	1	0.15	0.67
Technical drawing	0.09	0.43	0.16	0.15	1	0.08
Realistic copying	0.77	0.75	0.45	0.67	0.08	1
<b>Sham</b>						
Drawing from observation	1	0.76	0.63	0.75	0.43	0.81
Using perspective	0.76	1	0.79	0.90	0.55	0.80
Confidence marks	0.63	0.79	1	0.81	0.55	0.73
Using contrast	0.75	0.90	0.81	1	0.36	0.78
Technical drawing	0.43	0.55	0.55	0.36	1	0.38
Realistic copying	0.81	0.80	0.73	0.78	0.38	1

**Table A7***Item correlations of SADA in RFT*

	Drawing from observation	Using perspective	Confidence marks	Using contrast	Technical drawing	Realistic copying
<b>Global</b>						
Drawing from observation	1	0.73	0.65	0.80	0.34	0.64
Using perspective	0.73	1	0.62	0.82	0.43	0.63
Confidence marks	0.65	0.62	1	0.66	0.41	0.64
Using contrast	0.80	0.82	0.66	1	0.32	0.62
Technical drawing	0.34	0.43	0.41	0.32	1	0.18
Realistic copying	0.64	0.63	0.64	0.62	0.18	1
<b>Stimulation</b>						

Drawing from observation	1	0.79	0.67	0.82	0.54	0.58
Using perspective	0.79	1	0.68	0.86	0.41	0.59
Confidence marks	0.67	0.68	1	0.64	0.50	0.66
Using contrast	0.82	0.86	0.64	1	0.47	0.59
Technical drawing	0.54	0.41	0.50	0.47	1	0.15
Realistic copying	0.58	0.59	0.66	0.59	0.15	1
<b>Sham</b>						
Drawing from observation	1	0.66	0.65	0.78	0.13	0.70
Using perspective	0.66	1	0.55	0.78	0.44	0.69
Confidence marks	0.65	0.55	1	0.69	0.32	0.62
Using contrast	0.78	0.78	0.69	1	0.15	0.65
Technical drawing	0.13	0.44	0.32	0.15	1	0.23
Realistic copying	0.70	0.69	0.62	0.65	0.23	1

## Exploratory LMEMs

**Table A8**

*Relation between OFPT performance, tDCS, and DVs for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		df	P <sub>adj</sub>
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.18	2.46	3.16	15.6	<.001***
Stimulation	-0.1	0.05	-0.21	0.01	89.9	.155
OFPT	0.02	0.01	-0.01	0.04	159.7	.191
Stimulation × OFPT	0.03	0.02	-0.01	0.07	140.1	.193
<b>Creativity</b>						
Intercept	2.77	0.18	2.41	3.12	16.1	<.001***
Stimulation	-0.03	0.06	-0.15	0.10	89.6	.676
OFPT	0.04	0.01	0.01	0.06	164.2	<b>.017*</b>
Stimulation × OFPT	-0.03	0.02	-0.08	0.01	135.7	.215
<b>Skill</b>						
Intercept	2.53	0.22	2.09	2.97	15.8	<.001***
Stimulation	-0.08	0.05	-0.17	0.02	44.0	.185
OFPT	-0.01	0.01	-0.03	0.02	178.9	.623
Stimulation × OFPT	0.04	0.02	0	0.08	116.0	.058
<b>Liking</b>						
Intercept	2.50	0.20	2.11	2.90	15.4	<.001***
Stimulation	-0.09	0.06	-0.20	0.03	88.3	.18
OFPT	0.03	0.01	0	0.05	160.8	<b>.038*</b>
Stimulation × OFPT	0.01	0.02	-0.03	0.06	136.2	.563
<b>Realism</b>						
Intercept	2.06	0.15	1.76	2.35	19.3	<.001***
Stimulation	-0.06	0.07	-0.20	0.08	89.3	.41
OFPT	-0.03	0.02	-0.06	0.01	178.1	.138
Stimulation × OFPT	0.06	0.03	0	0.12	119.6	.075

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; df = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A9**

*Relation between personality, tDCS, and DVs for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		df	P <sub>adj</sub>
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.82	0.18	2.47	3.17	15.5	<.001***
Stimulation	-0.08	0.06	-0.19	0.03	87.9	.292
Extraversion	-0.03	0.02	-0.07	0	103.7	.173

Agreeableness	-0.02	0.02	-0.05	0.02	107	.505
Conscientiousness	-0.01	0.02	-0.05	0.02	122.2	.563
Neuroticism	0.01	0.02	-0.03	0.04	117.3	.724
Openness	0.04	0.02	0	0.07	136.1	.134
Extraversion × Stimulation	0.01	0.04	-0.06	0.08	100.9	.849
Agreeableness × Stimulation	0.07	0.04	0	0.14	104.6	.134
Conscientiousness × Stimulation	-0.07	0.03	-0.14	0	117.3	.134
Neuroticism × Stimulation	0.04	0.04	-0.03	0.11	115.6	.422
Openness × Stimulation	0.05	0.04	-0.02	0.12	129	.297
<b>Creativity</b>						
Intercept	2.77	0.18	2.42	3.12	16.2	<.001***
Stimulation	-0.01	0.07	-0.14	0.12	83.7	.954
Extraversion	0	0.02	-0.05	0.05	104	.971
Agreeableness	-0.02	0.02	-0.06	0.03	107.8	.824
Conscientiousness	0	0.02	-0.05	0.04	127.6	.954
Neuroticism	-0.05	0.02	-0.10	0	118.8	.223
Openness	0.01	0.02	-0.04	0.06	138.7	.953
Extraversion × Stimulation	0.04	0.04	-0.04	0.12	93.9	.824
Agreeableness × Stimulation	0.03	0.04	-0.05	0.11	99.1	.824
Conscientiousness × Stimulation	-0.06	0.04	-0.14	0.02	111	.617
Neuroticism × Stimulation	0.05	0.04	-0.03	0.14	111.6	.65
Openness × Stimulation	-0.02	0.04	-0.10	0.07	115.8	.954
<b>Skill</b>						
Intercept	2.54	0.23	2.10	2.99	15.6	<.001***
Stimulation	-0.05	0.05	-0.15	0.06	42.5	.542
Extraversion	-0.03	0.02	-0.08	0.01	118.6	.33
Agreeableness	-0.03	0.02	-0.07	0.02	121.8	.365
Conscientiousness	-0.02	0.02	-0.06	0.02	148.1	.542
Neuroticism	-0.01	0.02	-0.05	0.03	130.5	.691
Openness	0.07	0.02	0.03	0.11	156.3	.004**
Extraversion × Stimulation	0	0.03	-0.06	0.07	91.5	.914
Agreeableness × Stimulation	0.04	0.03	-0.02	0.10	97.4	.365
Conscientiousness × Stimulation	-0.05	0.03	-0.11	0.01	105.7	.33
Neuroticism × Stimulation	-0.01	0.03	-0.07	0.06	110.2	.889
Openness × Stimulation	0.06	0.03	0	0.13	105.7	.272
<b>Liking</b>						
Intercept	2.52	0.20	2.12	2.91	15.3	<.001***
Stimulation	-0.10	0.06	-0.22	0.01	88.8	.23
Extraversion	0.02	0.02	-0.02	0.05	105.6	.548
Agreeableness	-0.02	0.02	-0.05	0.02	109.5	.548
Conscientiousness	0	0.02	-0.04	0.04	126.2	.984
Neuroticism	-0.03	0.02	-0.07	0.01	120.6	.257
Openness	-0.03	0.02	-0.07	0.01	134.4	.257
Extraversion × Stimulation	0.03	0.04	-0.04	0.10	101.9	.548
Agreeableness × Stimulation	0.07	0.04	0	0.14	106.4	.212
Conscientiousness × Stimulation	-0.08	0.04	-0.15	-0.01	119.7	.167
Neuroticism × Stimulation	0	0.04	-0.07	0.07	118.2	.984
Openness × Stimulation	0.06	0.04	-0.02	0.13	125.3	.257
<b>Realism</b>						
Intercept	2.07	0.15	1.77	2.36	19	<.001***
Stimulation	-0.05	0.07	-0.19	0.09	88.8	.743
Extraversion	-0.01	0.03	-0.07	0.05	119.9	.884
Agreeableness	-0.04	0.03	-0.10	0.02	123	.464
Conscientiousness	-0.04	0.03	-0.10	0.01	148.9	.322
Neuroticism	0	0.03	-0.06	0.07	132.1	.884
Openness	0.07	0.03	0.01	0.13	154.4	.145
Extraversion × Stimulation	0.02	0.05	-0.07	0.11	93.1	.884
Agreeableness × Stimulation	-0.01	0.05	-0.10	0.08	99.6	.884
Conscientiousness × Stimulation	-0.05	0.05	-0.14	0.04	107.9	.464
Neuroticism × Stimulation	-0.08	0.05	-0.18	0.01	112.1	.253
Openness × Stimulation	0.10	0.05	0	0.20	104.7	.205

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A10***Relation between global CIAI score, tDCS, and DVs for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.18	2.46	3.16	15.5	<.001***
Stimulation	-0.08	0.06	-0.19	0.03	88.8	.146
CIAI-G	0.09	0.03	0.04	0.15	160.6	.003**
Stimulation × CIAI-G	0.09	0.06	-0.03	0.20	157.3	.146
<b>Creativity</b>						
Intercept	2.76	0.18	2.41	3.12	16.2	<.001***
Stimulation	-0.03	0.07	-0.16	0.10	88.7	.739
CIAI-G	-0.01	0.04	-0.09	0.06	171.8	.739
Stimulation × CIAI-G	-0.03	0.07	-0.17	0.11	140.6	.739
<b>Skill</b>						
Intercept	2.53	0.22	2.09	2.97	15.7	<.001***
Stimulation	-0.06	0.05	-0.16	0.04	46.4	.338
CIAI-G	0.11	0.03	0.05	0.18	175.4	.001**
Stimulation × CIAI-G	0.05	0.06	-0.06	0.17	124.1	.338
<b>Liking</b>						
Intercept	2.50	0.20	2.10	2.90	15.4	<.001***
Stimulation	-0.08	0.06	-0.20	0.03	90.7	.319
CIAI-G	0	0.03	-0.06	0.07	166.3	.904
Stimulation × CIAI-G	-0.02	0.06	-0.14	0.10	149.4	.904
<b>Realism</b>						
Intercept	2.05	0.15	1.76	2.35	18.6	<.001***
Stimulation	-0.03	0.08	-0.18	0.11	82.9	.655
CIAI-G	0.17	0.05	0.08	0.26	175.6	<.001***
Stimulation × CIAI-G	-0.05	0.08	-0.22	0.11	129.2	.655

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table A11***Relation between CIAI, tDCS, and DVs for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.18	2.46	3.16	15.5	<.001***
Stimulation	-0.06	0.06	-0.17	0.05	95.3	.672
Creativity	0	0.03	-0.06	0.05	174.2	.993
Interest in art making	-0.01	0.03	-0.06	0.03	176.8	.823
Attention	-0.02	0.03	-0.07	0.03	162	.823
Imagination before drawing	0.03	0.02	-0.01	0.08	152	.672
Imagination during drawing	0.02	0.03	-0.03	0.07	162.5	.755
Artistic ability	0.06	0.03	0.01	0.11	153.5	.134
Creativity × Stimulation	-0.02	0.06	-0.13	0.09	175.1	.918
Interest × Stimulation	0	0.05	-0.09	0.10	176.1	.993
Attention × Stimulation	-0.03	0.05	-0.13	0.08	160.1	.823
Imagine before × Stimulation	0	0.05	-0.10	0.10	148.6	.993
Imagine during × Stimulation	0.06	0.05	-0.04	0.16	160	.672
Artistic ability × Stimulation	0.05	0.05	-0.04	0.15	150.1	.672
<b>Creativity</b>						
Intercept	2.78	0.18	2.43	3.13	16	<.001***
Stimulation	-0.06	0.07	-0.19	0.07	94.7	.467
Creativity	0.05	0.03	-0.02	0.12	172.4	.306
Interest in art making	-0.04	0.03	-0.10	0.02	177.9	.306
Attention	-0.05	0.03	-0.11	0.02	165.6	.306
Imagination before drawing	-0.04	0.03	-0.10	0.02	157.6	.306
Imagination during drawing	-0.03	0.03	-0.09	0.03	166	.437
Artistic ability	0.05	0.03	-0.01	0.11	158.7	.306

	Creativity × Stimulation	-0.16	0.07	-0.29	-0.03	175.8	.14
	Interest × Stimulation	0.09	0.06	-0.03	0.21	174.5	.306
	Attention × Stimulation	-0.08	0.06	-0.20	0.05	157.2	.345
	Imagine before × Stimulation	-0.02	0.06	-0.13	0.10	143.4	.758
	Imagine during × Stimulation	0.04	0.06	-0.08	0.16	154.8	.508
	Artistic ability × Stimulation	0.05	0.06	-0.07	0.16	144.4	.494
<b>Skill</b>							
	Intercept	2.53	0.22	2.09	2.96	15.5	<.001***
	Stimulation	-0.01	0.05	-0.12	0.09	50.8	.938
	Creativity	-0.04	0.03	-0.10	0.01	165.6	.366
	Interest in art making	0.03	0.03	-0.02	0.08	177.7	.484
	Attention	-0.02	0.03	-0.07	0.04	174.9	.801
	Imagination before drawing	0.06	0.03	0.01	0.11	171.2	.08
	Imagination during drawing	0	0.03	-0.05	0.06	170	.938
	Artistic ability	0.10	0.03	0.04	0.15	170.5	<b>.002**</b>
	Creativity × Stimulation	0.09	0.06	-0.02	0.20	173.9	.366
	Interest × Stimulation	-0.07	0.05	-0.17	0.03	168.7	.38
	Attention × Stimulation	-0.05	0.05	-0.15	0.05	153.5	.484
	Imagine before × Stimulation	0	0.05	-0.09	0.09	135.1	.96
	Imagine during × Stimulation	0.01	0.05	-0.08	0.11	142.6	.938
	Artistic ability × Stimulation	0.06	0.05	-0.04	0.15	134	.484
<b>Liking</b>							
	Intercept	2.50	0.20	2.11	2.90	15.5	<.001***
	Stimulation	-0.07	0.06	-0.19	0.04	97.2	.577
	Creativity	0.03	0.03	-0.03	0.09	172.9	.577
	Interest in art making	-0.06	0.03	-0.11	-0.01	178.7	.213
	Attention	-0.06	0.03	-0.12	0	168.8	.213
	Imagination before drawing	0.02	0.03	-0.04	0.07	161.5	.69
	Imagination during drawing	0.02	0.03	-0.04	0.07	167	.69
	Artistic ability	0.02	0.03	-0.04	0.07	162.1	.69
	Creativity × Stimulation	-0.06	0.06	-0.18	0.05	177	.577
	Interest × Stimulation	-0.01	0.05	-0.11	0.10	174.6	.915
	Attention × Stimulation	-0.01	0.06	-0.12	0.10	158.9	.915
	Imagine before × Stimulation	-0.02	0.05	-0.13	0.08	144.7	.749
	Imagine during × Stimulation	0.06	0.05	-0.05	0.17	153.7	.577
	Artistic ability × Stimulation	0.04	0.05	-0.06	0.15	145	.69
<b>Realism</b>							
	Intercept	2.03	0.15	1.74	2.32	17.9	<.001***
	Stimulation	0.03	0.08	-0.12	0.18	94.3	.729
	Creativity	-0.02	0.04	-0.09	0.06	166.9	.729
	Interest in art making	0.07	0.04	0	0.14	176.7	.159
	Attention	-0.04	0.04	-0.12	0.03	165.4	.539
	Imagination before drawing	0.08	0.04	0.01	0.15	159.7	.141
	Imagination during drawing	0.02	0.04	-0.06	0.09	170.2	.729
	Artistic ability	0.08	0.04	0	0.15	162	.141
	Creativity × Stimulation	0.20	0.08	0.05	0.36	172.7	.084
	Interest × Stimulation	-0.14	0.07	-0.28	0	170.5	.141
	Attention × Stimulation	0.03	0.08	-0.12	0.17	151	.729
	Imagine before × Stimulation	-0.07	0.07	-0.20	0.07	135.4	.539
	Imagine during × Stimulation	-0.07	0.07	-0.21	0.07	149.2	.539
	Artistic ability × Stimulation	0.05	0.07	-0.09	0.18	136.6	.71

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A12**

*Relation between global SADA score, tDCS, and DVs for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.18	2.46	3.16	15.5	<.001***
Stimulation	-0.10	0.05	-0.20	0.01	89.6	.111
SADA-G	0.07	0.03	0.02	0.13	118.2	<b>.018*</b>
Stimulation × SADA-G	0.07	0.05	-0.03	0.17	109.9	.19

<b>Creativity</b>						
Intercept	2.77	0.18	2.41	3.12	16.3	<.001***
Stimulation	-0.02	0.06	-0.15	0.10	89	.701
SADA-G	0.05	0.04	-0.02	0.12	127.8	.339
Stimulation × SADA-G	0.03	0.06	-0.09	0.15	105.9	.701
<b>Skill</b>						
Intercept	2.53	0.22	2.09	2.97	15.7	<.001***
Stimulation	-0.07	0.05	-0.17	0.02	45.2	.196
SADA-G	0.10	0.03	0.03	0.16	144.6	.006**
Stimulation × SADA-G	0.04	0.05	-0.05	0.14	100.5	.358
<b>Liking</b>						
Intercept	2.50	0.20	2.11	2.90	15.4	<.001***
Stimulation	-0.08	0.06	-0.20	0.03	90	.31
SADA-G	0.02	0.03	-0.04	0.08	121	.699
Stimulation × SADA-G	-0.02	0.05	-0.13	0.09	110.9	.704
<b>Realism</b>						
Intercept	2.06	0.15	1.76	2.35	19.1	<.001***
Stimulation	-0.06	0.07	-0.20	0.08	89.2	.409
SADA-G	0.11	0.04	0.03	0.20	141.6	.025*
Stimulation × SADA-G	-0.07	0.07	-0.20	0.07	100.6	.409

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A13**

*Relation between SADA, tDCS, and DVs for creative drawing in LFT*

Predictors	Estimate	SE	95% CI		$df$	$P_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.18	2.46	3.16	15.4	<.001***
Stimulation	-0.15	0.06	-0.26	-0.04	93.9	.049*
Drawing from observation	0.08	0.04	0.01	0.16	152.7	.093
Using perspective and shading	0.03	0.06	-0.08	0.15	159.1	.651
Confidence in mark making	-0.02	0.04	-0.09	0.05	169.6	.651
Using contrast and tone	0.09	0.05	0	0.18	151.6	.141
Technical drawing	0	0.03	-0.06	0.05	133	.881
Realistic copying	-0.12	0.04	-0.20	-0.05	139.2	.006**
Drawing from observation × Stimulation	0.06	0.08	-0.09	0.22	153.9	.651
Using perspective × Stimulation	0.20	0.11	-0.02	0.43	160.1	.157
Confidence in marks × Stimulation	0.02	0.07	-0.12	0.16	170.5	.811
Using contrast × Stimulation	-0.23	0.09	-0.41	-0.05	153	.05
Technical drawing × Stimulation	-0.09	0.06	-0.21	0.02	134.3	.204
Realistic copying × Stimulation	0.05	0.07	-0.09	0.19	140.4	.651
<b>Creativity</b>						
Intercept	2.75	0.18	2.40	3.11	16.2	<.001***
Stimulation	-0.04	0.07	-0.17	0.09	95.5	.535
Drawing from observation	0.06	0.05	-0.04	0.16	168.2	.431
Using perspective and shading	-0.08	0.07	-0.23	0.07	173.1	.431
Confidence in mark making	-0.09	0.05	-0.18	0	174.3	.154
Using contrast and tone	0.07	0.06	-0.05	0.19	162.2	.431
Technical drawing	0.03	0.04	-0.04	0.11	149.8	.529
Realistic copying	0.03	0.05	-0.06	0.13	156.7	.535
Drawing from observation × Stimulation	0.15	0.10	-0.04	0.34	144.8	.284
Using perspective × Stimulation	0.31	0.14	0.04	0.59	150.7	.094
Confidence in marks × Stimulation	0.06	0.09	-0.12	0.23	156.7	.535
Using contrast × Stimulation	-0.29	0.11	-0.51	-0.06	135.2	.081
Technical drawing × Stimulation	-0.17	0.07	-0.31	-0.03	125.5	.081
Realistic copying × Stimulation	-0.09	0.09	-0.26	0.08	132.8	.431
<b>Skill</b>						
Intercept	2.53	0.22	2.09	2.97	15.6	<.001***
Stimulation	-0.13	0.05	-0.23	-0.03	48.5	.062
Drawing from observation	0.11	0.04	0.02	0.19	176	.062
Using perspective and shading	0.11	0.06	-0.02	0.23	178	.272
Confidence in mark making	0.02	0.04	-0.06	0.10	177.2	.696

Using contrast and tone	0.02	0.05	-0.08	0.13	174.3	.696
Technical drawing	-0.05	0.03	-0.12	0.02	163	.34
Realistic copying	-0.13	0.04	-0.22	-0.05	167.3	<b>.011*</b>
Drawing from observation × Stimulation	-0.03	0.08	-0.18	0.12	131.9	.713
Using perspective × Stimulation	0.11	0.11	-0.11	0.33	135.4	.476
Confidence in marks × Stimulation	-0.10	0.07	-0.24	0.05	144.9	.34
Using contrast × Stimulation	-0.07	0.09	-0.24	0.11	124	.602
Technical drawing × Stimulation	-0.06	0.06	-0.16	0.05	113.9	.476
Realistic copying × Stimulation	0.09	0.07	-0.05	0.23	120	.34
<b>Liking</b>						
Intercept	2.49	0.20	2.10	2.89	15.5	<.001***
Stimulation	-0.12	0.06	-0.23	0	91.2	.114
Drawing from observation	0.10	0.04	0.01	0.19	165.9	.1
Using perspective and shading	0.01	0.06	-0.11	0.14	171.4	.906
Confidence in mark making	-0.03	0.04	-0.11	0.05	171.9	.534
Using contrast and tone	-0.01	0.05	-0.11	0.10	158.1	.914
Technical drawing	0.03	0.03	-0.04	0.09	145.8	.526
Realistic copying	-0.08	0.04	-0.16	0	153.6	.114
Drawing from observation × Stimulation	0.12	0.08	-0.05	0.28	143.6	.341
Using perspective × Stimulation	0.27	0.12	0.03	0.51	150.1	.1
Confidence in marks × Stimulation	-0.07	0.08	-0.22	0.08	155.2	.526
Using contrast × Stimulation	-0.27	0.10	-0.47	-0.07	132.7	.054
Technical drawing × Stimulation	-0.06	0.06	-0.17	0.06	123.5	.526
Realistic copying × Stimulation	-0.04	0.08	-0.19	0.11	131.6	.711
<b>Realism</b>						
Intercept	2.06	0.15	1.77	2.35	18.4	<.001***
Stimulation	-0.12	0.08	-0.26	0.03	84.3	.19
Drawing from observation	0.15	0.06	0.02	0.27	169.1	.077
Using perspective and shading	0.18	0.09	0	0.35	173.6	.123
Confidence in mark making	0.08	0.06	-0.03	0.19	179	.19
Using contrast and tone	-0.06	0.07	-0.21	0.09	170.1	.535
Technical drawing	-0.08	0.05	-0.17	0.01	150.2	.165
Realistic copying	-0.17	0.06	-0.29	-0.06	156.5	<b>.027*</b>
Drawing from observation × Stimulation	-0.19	0.11	-0.42	0.03	128.7	.165
Using perspective × Stimulation	0.08	0.17	-0.25	0.41	133.8	.682
Confidence in marks × Stimulation	-0.27	0.11	-0.48	-0.06	146.5	.054
Using contrast × Stimulation	0.01	0.13	-0.25	0.27	123.3	.916
Technical drawing × Stimulation	-0.04	0.08	-0.20	0.12	108	.682
Realistic copying × Stimulation	0.21	0.10	0.01	0.41	114.5	.123

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A14**

*Relation between OFPT, tDCS, and DVs for realistic drawing in LFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.74	2.42	22.1	<.001***
Stimulation	0.1	0.06	-0.03	0.22	29.7	.272
OFPT	0	0.02	-0.03	0.04	50.6	.936
Stimulation × OFPT	0.02	0.03	-0.03	0.07	33.4	.685
<b>Skill</b>						
Intercept	2.19	0.19	1.82	2.57	21.3	<.001***
Stimulation	0.09	0.08	-0.07	0.25	24.7	.561
OFPT	-0.01	0.02	-0.05	0.03	53.5	.949
Stimulation × OFPT	0	0.03	-0.06	0.06	33.8	.955
<b>Stereotypicality</b>						
Intercept	3.52	0.31	2.91	4.12	15.7	<.001***
Stimulation	0.2	0.08	0.05	0.36	855.8	<b>.018*</b>
OFPT	-0.02	0.02	-0.06	0.02	104.9	.369
Stimulation × OFPT	0.01	0.03	-0.05	0.07	650.8	.666
<b>Realism (Externally Cued)</b>						
Intercept	2.43	0.23	1.99	2.88	27.1	<.001***

Stimulation	-0.07	0.11	-0.28	0.14	29.9	.904
OFPT	-0.01	0.03	-0.07	0.05	51.7	.904
Stimulation × OFPT	0	0.04	-0.09	0.08	33.5	.952

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

Table A15

Relation between personality, tDCS, and DVs for realistic drawing in LFT

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.75	2.41	20.4	<.001***
Stimulation	0.13	0.06	0.02	0.24	23.5	.143
Extraversion	-0.04	0.04	-0.11	0.03	49	.319
Agreeableness	-0.08	0.04	-0.15	-0.01	50.3	.14
Conscientiousness	0.03	0.03	-0.03	0.09	56.5	.389
Neuroticism	-0.06	0.04	-0.13	0.01	48.5	.235
Openness	0.06	0.03	0	0.12	52.3	.189
Extraversion × Stimulation	-0.05	0.04	-0.12	0.02	22.4	.283
Agreeableness × Stimulation	0.05	0.04	-0.03	0.12	25.2	.319
Conscientiousness × Stimulation	0.06	0.04	-0.02	0.13	26.3	.283
Neuroticism × Stimulation	0.01	0.04	-0.07	0.09	30.3	.746
Openness × Stimulation	-0.05	0.04	-0.13	0.03	23.6	.319
<b>Skill</b>						
Intercept	2.19	0.19	1.83	2.56	19	<.001***
Stimulation	0.14	0.07	0	0.28	18.2	.135
Extraversion	-0.07	0.04	-0.14	0	43.7	.135
Agreeableness	-0.04	0.04	-0.11	0.04	44.8	.404
Conscientiousness	0.02	0.03	-0.05	0.08	56.5	.677
Neuroticism	-0.04	0.04	-0.11	0.04	44.7	.404
Openness	0.11	0.03	0.04	0.17	55.1	.013*
Extraversion × Stimulation	-0.10	0.04	-0.18	-0.02	22.1	.09
Agreeableness × Stimulation	0.08	0.04	-0.01	0.16	25	.14
Conscientiousness × Stimulation	-0.01	0.04	-0.09	0.07	26.4	.795
Neuroticism × Stimulation	0.10	0.05	0.01	0.19	29.9	.115
Openness × Stimulation	-0.05	0.05	-0.14	0.04	23.8	.404
<b>Stereotypicality</b>						
Intercept	3.54	0.31	2.93	4.14	15.7	<.001***
Stimulation	0.20	0.08	0.04	0.35	854.6	.086
Extraversion	0	0.04	-0.07	0.07	40.3	.893
Agreeableness	0.02	0.04	-0.05	0.09	41.8	.851
Conscientiousness	-0.01	0.03	-0.08	0.05	57	.851
Neuroticism	0.05	0.04	-0.02	0.12	45.7	.538
Openness	0.01	0.03	-0.06	0.08	72	.851
Extraversion × Stimulation	-0.08	0.05	-0.18	0.02	848.1	.45
Agreeableness × Stimulation	0.05	0.05	-0.05	0.16	786.6	.661
Conscientiousness × Stimulation	-0.05	0.05	-0.15	0.05	679.4	.661
Neuroticism × Stimulation	-0.02	0.05	-0.12	0.09	600.4	.851
Openness × Stimulation	0.03	0.06	-0.08	0.14	610.3	.851
<b>Realism (Externally Cued)</b>						
Intercept	2.46	0.23	2.01	2.90	25.4	<.001***
Stimulation	-0.06	0.10	-0.26	0.14	24.7	.779
Extraversion	-0.04	0.06	-0.16	0.08	51.2	.779
Agreeableness	0.02	0.06	-0.10	0.14	52.4	.842
Conscientiousness	0.07	0.05	-0.03	0.18	56.8	.657
Neuroticism	0.01	0.06	-0.11	0.13	51.5	.842
Openness	0.03	0.05	-0.07	0.14	50.9	.779
Extraversion × Stimulation	0.01	0.06	-0.11	0.14	24.1	.842
Agreeableness × Stimulation	-0.04	0.06	-0.16	0.09	27	.779
Conscientiousness × Stimulation	-0.07	0.06	-0.20	0.05	28.3	.766
Neuroticism × Stimulation	-0.15	0.07	-0.28	-0.01	30.9	.24
Openness × Stimulation	0.04	0.07	-0.10	0.19	25.2	.779

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table A16**

*Relation between global CIAI score, tDCS, and DVs for realistic drawing in LFT*

Predictors	Estimate	SE	95% CI		<i>df</i>	<i>p</i> <sub>adj</sub>
			<i>LL</i>	<i>UL</i>		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.74	2.42	22.1	<.001***
Stimulation	0.10	0.06	-0.03	0.22	29.7	.272
CIAI-G	0	0.02	-0.03	0.04	50.6	.936
Stimulation × CIAI-G	0.02	0.03	-0.03	0.07	33.4	.685
<b>Skill</b>						
Intercept	2.19	0.19	1.82	2.57	21.3	<.001***
Stimulation	0.09	0.08	-0.07	0.25	24.7	.561
CIAI-G	-0.01	0.02	-0.05	0.03	53.5	.949
Stimulation × CIAI-G	0	0.03	-0.06	0.06	33.8	.955
<b>Stereotypicality</b>						
Intercept	3.52	0.31	2.91	4.12	15.7	<.001***
Stimulation	0.20	0.08	0.05	0.36	855.8	<b>.018*</b>
CIAI-G	-0.02	0.02	-0.06	0.02	104.9	.369
Stimulation × CIAI-G	0.01	0.03	-0.05	0.07	650.8	.666
<b>Realism (Externally Cued)</b>						
Intercept	2.43	0.23	1.99	2.88	27.1	<.001***
Stimulation	-0.07	0.11	-0.28	0.14	29.9	.904
CIAI-G	-0.01	0.03	-0.07	0.05	51.7	.904
Stimulation × CIAI-G	0	0.04	-0.09	0.08	33.5	.952

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table A17**

*Relation between CIAI, tDCS, and DVs for realistic drawing in LFT*

Predictors	Estimate	SE	95% CI		<i>df</i>	<i>p</i> <sub>adj</sub>
			<i>LL</i>	<i>UL</i>		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.16	1.76	2.40	18.5	<.001***
Stimulation	0.17	0.07	0.03	0.30	28.3	.157
Creativity	0.03	0.04	-0.04	0.11	46.1	.695
Interest in art making	0.05	0.04	-0.03	0.12	55.2	.52
Attention	-0.08	0.04	-0.16	0	56.2	.246
Imagination before drawing	0.07	0.04	-0.01	0.14	56.8	.342
Imagination during drawing	0.01	0.04	-0.08	0.09	58.5	.937
Artistic ability	0.05	0.04	-0.03	0.13	58.8	.52
Creativity × Stimulation	0.02	0.08	-0.14	0.18	50.2	.937
Interest × Stimulation	0.07	0.07	-0.07	0.22	49.2	.617
Attention × Stimulation	0.05	0.07	-0.10	0.19	43.5	.81
Imagine before × Stimulation	-0.01	0.07	-0.13	0.12	35.4	.937
Imagine during × Stimulation	-0.04	0.07	-0.17	0.10	39.1	.843
Artistic ability × Stimulation	-0.01	0.07	-0.14	0.12	35	.937
<b>Skill</b>						
Intercept	2.21	0.18	1.85	2.57	17.9	<.001***
Stimulation	0.16	0.08	0.01	0.31	22.7	.12
Creativity	0.07	0.04	-0.01	0.14	42.3	.192
Interest in art making	0.03	0.04	-0.04	0.10	51.8	.686
Attention	-0.09	0.04	-0.17	-0.01	55.9	.12
Imagination before drawing	0.08	0.04	0.01	0.15	57.3	.12
Imagination during drawing	-0.01	0.04	-0.09	0.07	55	.921
Artistic ability	0.08	0.04	0.01	0.16	58.6	.12
Creativity × Stimulation	0	0.08	-0.15	0.16	46.4	.988
Interest × Stimulation	0.09	0.07	-0.05	0.23	45.6	.396

Attention × Stimulation	0.04	0.07	-0.10	0.18	42.2	.806
Imagine before × Stimulation	0.10	0.06	-0.03	0.22	34	.258
Imagine during × Stimulation	-0.03	0.07	-0.16	0.11	36.9	.892
Artistic ability × Stimulation	-0.01	0.06	-0.14	0.11	33.2	.929
<b>Stereotypicality</b>						
Intercept	3.51	0.31	2.91	4.11	15.3	<.001***
Stimulation	0.24	0.08	0.09	0.40	860.5	<b>.019*</b>
Creativity	0.08	0.04	-0.01	0.16	164.8	.216
Interest in art making	0	0.04	-0.08	0.07	114	.929
Attention	-0.01	0.04	-0.09	0.07	92.2	.929
Imagination before drawing	0.08	0.04	0	0.16	79.6	.216
Imagination during drawing	0.01	0.04	-0.07	0.10	73.2	.929
Artistic ability	-0.04	0.04	-0.12	0.04	69.9	.507
Creativity × Stimulation	0.01	0.09	-0.16	0.18	130.4	.929
Interest × Stimulation	0.11	0.08	-0.04	0.26	156.3	.387
Attention × Stimulation	0.04	0.08	-0.12	0.19	206.3	.929
Imagine before × Stimulation	-0.02	0.07	-0.16	0.13	299.1	.929
Imagine during × Stimulation	-0.08	0.08	-0.24	0.07	275.3	.507
Artistic ability × Stimulation	-0.13	0.07	-0.28	0.01	339	.216
<b>Realism (Externally Cued)</b>						
Intercept	2.42	0.21	2.01	2.84	21.4	<.001***
Stimulation	-0.08	0.08	-0.24	0.09	29	.512
Creativity	-0.03	0.05	-0.13	0.07	39.1	.626
Interest in art making	-0.05	0.05	-0.14	0.05	48.1	.512
Attention	0.06	0.05	-0.05	0.16	47.9	.512
Imagination before drawing	-0.09	0.05	-0.19	0.02	48.5	.289
Imagination during drawing	0.16	0.06	0.05	0.27	56.2	<b>.018*</b>
Artistic ability	0.25	0.05	0.14	0.36	55.5	<.001***
Creativity × Stimulation	0.02	0.10	-0.18	0.23	42	.846
Interest × Stimulation	0.07	0.09	-0.11	0.25	42.9	.574
Attention × Stimulation	-0.11	0.09	-0.30	0.07	37.7	.512
Imagine before × Stimulation	0.04	0.08	-0.12	0.20	29.9	.718
Imagine during × Stimulation	-0.30	0.09	-0.46	-0.13	34.1	<b>.006**</b>
Artistic ability × Stimulation	-0.08	0.08	-0.24	0.08	29.6	.512

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A18**

*Relation between global SADA score, tDCS, and DVs for realistic drawing in LFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.75	2.41	21.2	<.001***
Stimulation	0.10	0.06	-0.03	0.22	27	.298
SADA-G	0.06	0.05	-0.04	0.17	57.8	.338
Stimulation × SADA-G	0.03	0.06	-0.10	0.15	29.1	.682
<b>Skill</b>						
Intercept	2.19	0.19	1.82	2.57	20.1	<.001***
Stimulation	0.09	0.08	-0.06	0.24	27.8	.332
SADA-G	0.12	0.06	0.01	0.24	54.7	.08
Stimulation × SADA-G	0.05	0.07	-0.10	0.19	30.5	.54
<b>Stereotypicality</b>						
Intercept	3.52	0.31	2.91	4.12	15.7	<.001***
Stimulation	0.20	0.08	0.05	0.35	855.5	<b>.018*</b>
SADA-G	0	0.05	-0.10	0.10	55.1	.983
Stimulation × SADA-G	-0.18	0.07	-0.32	-0.03	841.8	<b>.024*</b>
<b>Realism (Externally Cued)</b>						
Intercept	2.43	0.22	2	2.86	25	<.001***
Stimulation	-0.07	0.11	-0.28	0.14	25	.516
SADA-G	0.13	0.09	-0.03	0.30	57.1	.213
Stimulation × SADA-G	-0.15	0.10	-0.35	0.05	27.6	.213

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table A19**

*Relation between SADA, tDCS, and DVs for realistic drawing in LFT*

Predictors	Estimate	SE	95% CI		<i>df</i>	<i>p<sub>adj</sub></i>
			<i>LL</i>	<i>UL</i>		
<b>Realism (Internally Cued)</b>						
Intercept	2.08	0.17	1.75	2.41	20.5	<.001***
Stimulation	0.02	0.05	-0.07	0.12	880.8	.753
Drawing from observation	0.17	0.06	0.05	0.28	226.2	<b>.022*</b>
Using perspective and shading	0.23	0.08	0.07	0.39	193.6	<b>.022*</b>
Confidence in mark making	0	0.05	-0.10	0.09	307.7	.939
Using contrast and tone	-0.07	0.07	-0.20	0.06	324.8	.411
Technical drawing	-0.13	0.05	-0.21	-0.04	200.6	<b>.022*</b>
Realistic copying	-0.15	0.06	-0.26	-0.04	157.4	<b>.03*</b>
Drawing from observation × Stimulation	-0.03	0.08	-0.18	0.13	799.6	.806
Using perspective × Stimulation	-0.18	0.12	-0.41	0.05	841.3	.191
Confidence in marks × Stimulation	0.14	0.08	-0.01	0.30	663.7	.133
Using contrast × Stimulation	0.15	0.09	-0.03	0.33	832.7	.187
Technical drawing × Stimulation	0.03	0.05	-0.08	0.13	883.8	.753
Realistic copying × Stimulation	-0.13	0.07	-0.27	0.01	868.8	.133
<b>Skill</b>						
Intercept	2.19	0.19	1.83	2.56	19.1	<.001***
Stimulation	0.03	0.07	-0.12	0.18	22.8	.819
Drawing from observation	0.13	0.07	-0.01	0.26	57.9	.296
Using perspective and shading	0.16	0.10	-0.04	0.35	58.1	.296
Confidence in mark making	0.02	0.06	-0.10	0.14	53.6	.819
Using contrast and tone	0.02	0.08	-0.15	0.18	55.5	.847
Technical drawing	-0.11	0.05	-0.22	-0.01	59.1	.29
Realistic copying	-0.10	0.07	-0.23	0.03	59.1	.296
Drawing from observation × Stimulation	-0.03	0.11	-0.24	0.18	37.5	.819
Using perspective × Stimulation	-0.10	0.16	-0.41	0.21	36.9	.725
Confidence in marks × Stimulation	0.16	0.10	-0.04	0.36	40.4	.296
Using contrast × Stimulation	0.12	0.13	-0.13	0.36	35	.629
Technical drawing × Stimulation	0.05	0.07	-0.09	0.20	33	.725
Realistic copying × Stimulation	-0.16	0.10	-0.35	0.03	34.5	.296
<b>Stereotypicality</b>						
Intercept	3.50	0.31	2.89	4.10	15.6	<.001***
Stimulation	0.17	0.08	0.01	0.33	874.3	.224
Drawing from observation	0.04	0.07	-0.11	0.18	90.3	.734
Using perspective and shading	0.10	0.10	-0.10	0.31	98.6	.734
Confidence in mark making	0.01	0.06	-0.12	0.14	119.8	.86
Using contrast and tone	-0.04	0.09	-0.21	0.13	93.1	.734
Technical drawing	-0.04	0.06	-0.15	0.07	67.3	.734
Realistic copying	-0.10	0.07	-0.23	0.03	73	.529
Drawing from observation × Stimulation	0.09	0.13	-0.16	0.33	437.6	.734
Using perspective × Stimulation	0.11	0.18	-0.25	0.47	405.1	.734
Confidence in marks × Stimulation	-0.09	0.12	-0.32	0.14	310.5	.734
Using contrast × Stimulation	-0.06	0.15	-0.35	0.23	495.8	.734
Technical drawing × Stimulation	-0.18	0.09	-0.35	0	654.7	.224
Realistic copying × Stimulation	-0.13	0.11	-0.35	0.09	560.3	.687
<b>Realism (Externally Cued)</b>						
Intercept	2.43	0.22	2.00	2.85	23.3	<.001***
Stimulation	-0.09	0.10	-0.28	0.11	20.9	.61
Drawing from observation	0	0.11	-0.21	0.21	54.8	.99
Using perspective and shading	-0.02	0.15	-0.31	0.28	55.4	.99
Confidence in mark making	-0.02	0.09	-0.20	0.16	45.3	.969
Using contrast and tone	0.12	0.13	-0.13	0.37	47.4	.61
Technical drawing	-0.14	0.08	-0.30	0.03	58.7	.473

Realistic copying	0.07	0.10	-0.13	0.28	59.2	.61
Drawing from observation × Stimulation	0.15	0.16	-0.16	0.47	26.1	.61
Using perspective × Stimulation	0.33	0.24	-0.13	0.80	25.5	.473
Confidence in marks × Stimulation	0.12	0.16	-0.19	0.43	28.5	.61
Using contrast × Stimulation	-0.49	0.19	-0.86	-0.11	22.7	.132
Technical drawing × Stimulation	-0.16	0.11	-0.38	0.06	22.3	.473
Realistic copying × Stimulation	-0.12	0.14	-0.40	0.16	24.2	.61

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A20**

*Relation between OFPT, tDCS, and DVs for creative drawing in RFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.21	2.41	3.22	15.4	<.001***
Stimulation	0.05	0.06	-0.06	0.16	90	.527
OFPT	0.01	0.01	-0.01	0.02	115.8	.527
Stimulation × OFPT	-0.01	0.02	-0.04	0.02	109.6	.527
<b>Creativity</b>						
Intercept	2.83	0.19	2.45	3.21	16.4	<.001***
Stimulation	0.01	0.07	-0.12	0.14	90.5	.912
OFPT	0.01	0.01	-0.01	0.04	132.2	.563
Stimulation × OFPT	-0.02	0.02	-0.05	0.02	102.3	.563
<b>Skill</b>						
Intercept	2.48	0.19	2.11	2.84	15.9	<.001***
Stimulation	0.09	0.05	-0.02	0.19	90.2	.144
OFPT	0.02	0.01	0	0.04	133.7	.084
Stimulation × OFPT	0	0.02	-0.03	0.03	100.6	.819
<b>Liking</b>						
Intercept	2.47	0.19	2.10	2.85	15.4	<.001***
Stimulation	0.01	0.07	-0.14	0.15	88.3	.941
OFPT	0.01	0.01	-0.01	0.03	160.8	.522
Stimulation × OFPT	-0.01	0.02	-0.04	0.03	136.2	.941
<b>Realism</b>						
Intercept	2.16	0.17	1.84	2.49	19.3	<.001***
Stimulation	0.03	0.09	-0.14	0.20	89.3	.76
OFPT	0.02	0.02	-0.02	0.05	178.1	.647
Stimulation × OFPT	0.01	0.03	-0.04	0.06	119.6	.76

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A21**

*Relation between personality, tDCS, and DVs for creative drawing in RFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.82	0.21	2.41	3.22	15.4	<.001***
Stimulation	0.04	0.06	-0.07	0.15	93.5	.616
Extraversion	-0.01	0.02	-0.04	0.02	119	.616
Agreeableness	-0.03	0.02	-0.06	0.01	106	.391
Conscientiousness	0.03	0.02	-0.01	0.07	152.9	.391
Neuroticism	0.01	0.02	-0.02	0.04	101.2	.616
Openness	0	0.02	-0.04	0.03	114.5	.913
Extraversion × Stimulation	-0.02	0.03	-0.08	0.04	115.9	.616
Agreeableness × Stimulation	0.04	0.03	-0.02	0.11	105.4	.477
Conscientiousness × Stimulation	0.01	0.04	-0.07	0.09	147.2	.853
Neuroticism × Stimulation	-0.03	0.03	-0.09	0.03	100.5	.576
Openness × Stimulation	0.06	0.03	-0.01	0.12	112	.391

<b>Creativity</b>						
Intercept	2.84	0.19	2.46	3.22	16.4	<.001***
Stimulation	-0.02	0.07	-0.15	0.11	94.7	.978
Extraversion	-0.01	0.02	-0.06	0.03	133	.978
Agreeableness	-0.03	0.03	-0.08	0.02	112.5	.562
Conscientiousness	0.01	0.03	-0.05	0.07	171.5	.978
Neuroticism	-0.04	0.02	-0.09	0.01	106.8	.525
Openness	0	0.02	-0.05	0.05	127.3	.978
Extraversion × Stimulation	-0.01	0.04	-0.08	0.07	105.6	.978
Agreeableness × Stimulation	-0.04	0.04	-0.12	0.04	102.3	.692
Conscientiousness × Stimulation	0.06	0.05	-0.04	0.17	130.9	.562
Neuroticism × Stimulation	0	0.04	-0.07	0.07	95.9	.978
Openness × Stimulation	0.05	0.04	-0.03	0.13	104.3	.562
<b>Skill</b>						
Intercept	2.47	0.19	2.11	2.84	15.9	<.001***
Stimulation	0.08	0.05	-0.02	0.18	96.6	.402
Extraversion	-0.02	0.02	-0.06	0.01	136.3	.407
Agreeableness	-0.04	0.02	-0.08	0	115.8	.345
Conscientiousness	0	0.02	-0.05	0.05	171.8	.995
Neuroticism	-0.01	0.02	-0.04	0.03	110.1	.914
Openness	0.03	0.02	-0.01	0.07	130.9	.407
Extraversion × Stimulation	-0.02	0.03	-0.08	0.04	106.7	.719
Agreeableness × Stimulation	0.03	0.03	-0.03	0.10	103.9	.596
Conscientiousness × Stimulation	0	0.04	-0.08	0.08	129.9	.995
Neuroticism × Stimulation	-0.06	0.03	-0.11	0	97.7	.279
Openness × Stimulation	0.01	0.03	-0.05	0.07	105.3	.914
<b>Liking</b>						
Intercept	2.48	0.19	2.10	2.85	15.8	<.001***
Stimulation	-0.01	0.07	-0.15	0.13	30.3	.936
Extraversion	-0.01	0.02	-0.05	0.03	127.4	.92
Agreeableness	-0.02	0.02	-0.07	0.02	109.9	.679
Conscientiousness	0.02	0.03	-0.03	0.08	165.4	.679
Neuroticism	0	0.02	-0.04	0.04	104.7	.941
Openness	-0.02	0.02	-0.06	0.02	122	.679
Extraversion × Stimulation	-0.02	0.04	-0.08	0.05	110	.883
Agreeableness × Stimulation	0.04	0.04	-0.04	0.12	103.9	.679
Conscientiousness × Stimulation	0.07	0.05	-0.03	0.16	138	.679
Neuroticism × Stimulation	-0.02	0.04	-0.08	0.05	98.1	.883
Openness × Stimulation	0.06	0.04	-0.02	0.13	107.8	.679
<b>Realism</b>						
Intercept	2.14	0.17	1.81	2.47	20	<.001***
Stimulation	0.05	0.08	-0.11	0.21	97.6	.741
Extraversion	-0.01	0.03	-0.07	0.05	146.7	.881
Agreeableness	-0.03	0.04	-0.10	0.05	123.1	.741
Conscientiousness	-0.09	0.04	-0.17	-0.02	177.5	.07
Neuroticism	0.02	0.03	-0.05	0.09	116	.741
Openness	0.03	0.03	-0.04	0.10	141.6	.741
Extraversion × Stimulation	0	0.04	-0.09	0.09	103	.997
Agreeableness × Stimulation	0.01	0.05	-0.09	0.11	104	.881
Conscientiousness × Stimulation	-0.14	0.06	-0.27	-0.01	123.8	.101
Neuroticism × Stimulation	-0.11	0.04	-0.20	-0.03	96.5	.07
Openness × Stimulation	-0.09	0.05	-0.18	0	103.2	.145

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A22**

*Relation between global CIAI score, tDCS, and DVs for creative drawing in RFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.21	2.41	3.22	15.4	<.001***
Stimulation	0.03	0.06	-0.08	0.14	90.4	.55
CIAI-G	0.05	0.03	-0.01	0.12	141.3	.189

Stimulation × CIAI-G	0.09	0.06	-0.03	0.22	127.5	.189
<b>Creativity</b>						
Intercept	2.83	0.19	2.45	3.21	16.4	<.001***
Stimulation	0	0.07	-0.13	0.13	89.1	.959
CIAI-G	-0.01	0.05	-0.10	0.08	161.1	.959
Stimulation × CIAI-G	0.10	0.08	-0.05	0.25	113	.392
<b>Skill</b>						
Intercept	2.47	0.19	2.11	2.84	15.9	<.001***
Stimulation	0.05	0.05	-0.05	0.15	91.4	.39
CIAI-G	0.13	0.04	0.06	0.20	162.1	<.001***
Stimulation × CIAI-G	0.04	0.06	-0.08	0.16	110.6	.538
<b>Liking</b>						
Intercept	2.47	0.19	2.09	2.84	15.9	<.001***
Stimulation	0	0.07	-0.14	0.14	29.1	.968
CIAI-G	0.02	0.04	-0.06	0.10	156.9	.911
Stimulation × CIAI-G	0.09	0.07	-0.05	0.24	122	.402
<b>Realism</b>						
Intercept	2.17	0.17	1.84	2.49	19.7	<.001***
Stimulation	-0.01	0.08	-0.18	0.15	91.4	.894
CIAI-G	0.21	0.06	0.09	0.33	163.9	.001**
Stimulation × CIAI-G	-0.07	0.10	-0.27	0.13	108.1	.636

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

Table A23

Relation between CIAI, tDCS, and DVs for creative drawing in RFT

Predictors	Estimate	SE	95% CI		$df$	$P_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.79	0.21	2.39	3.20	15.4	<.001***
Stimulation	0	0.06	-0.12	0.11	104.1	.943
Creativity	-0.04	0.03	-0.11	0.02	150.7	.419
Interest in art making	0.01	0.03	-0.04	0.06	154.5	.813
Attention	0.06	0.02	0.01	0.11	175.6	.077
Imagination before drawing	0.03	0.03	-0.02	0.09	143.5	.497
Imagination during drawing	-0.04	0.03	-0.09	0.01	125.1	.333
Artistic ability	0.08	0.03	0.03	0.14	139.9	.022*
Creativity × Stimulation	-0.07	0.07	-0.20	0.07	146.8	.521
Interest × Stimulation	-0.01	0.05	-0.11	0.08	143.2	.855
Attention × Stimulation	0.07	0.05	-0.02	0.17	170	.34
Imagine before × Stimulation	0.02	0.05	-0.08	0.13	131.2	.826
Imagine during × Stimulation	0.01	0.05	-0.08	0.11	115.9	.855
Artistic ability × Stimulation	0.11	0.05	0.01	0.21	131.2	.126
<b>Creativity</b>						
Intercept	2.80	0.19	2.42	3.18	16.4	<.001***
Stimulation	0.06	0.07	-0.08	0.20	100.6	.771
Creativity	0.07	0.05	-0.02	0.16	143.7	.417
Interest in art making	-0.01	0.03	-0.07	0.06	162	.976
Attention	-0.02	0.03	-0.08	0.05	175.9	.976
Imagination before drawing	0.01	0.04	-0.07	0.09	153	.976
Imagination during drawing	-0.10	0.04	-0.17	-0.03	139.3	.043*
Artistic ability	0.01	0.04	-0.06	0.09	155.2	.976
Creativity × Stimulation	-0.14	0.09	-0.31	0.04	131.7	.417
Interest × Stimulation	0.07	0.06	-0.05	0.20	122.2	.554
Attention × Stimulation	0	0.06	-0.12	0.13	155.1	.976
Imagine before × Stimulation	0.15	0.07	0.01	0.29	110.5	.155
Imagine during × Stimulation	0	0.06	-0.11	0.12	101.5	.976
Artistic ability × Stimulation	-0.02	0.06	-0.15	0.11	120.1	.976
<b>Skill</b>						
Intercept	2.47	0.19	2.10	2.83	15.7	<.001***
Stimulation	0.01	0.06	-0.10	0.12	99.8	.948
Creativity	-0.05	0.04	-0.12	0.02	147	.601
Interest in art making	0.02	0.03	-0.04	0.07	158	.927

Attention	0.05	0.03	0	0.10	176.6	.207
Imagination before drawing	0.03	0.03	-0.03	0.08	147.7	.927
Imagination during drawing	-0.01	0.03	-0.06	0.04	129.5	.927
Artistic ability	0.16	0.03	0.11	0.22	146	<.001***
Creativity × Stimulation	-0.01	0.07	-0.15	0.12	137.8	.948
Interest × Stimulation	-0.03	0.05	-0.13	0.07	130.1	.927
Attention × Stimulation	0	0.05	-0.09	0.10	162.2	.976
Imagine before × Stimulation	0.02	0.05	-0.09	0.13	118	.927
Imagine during × Stimulation	0.02	0.05	-0.07	0.11	105.6	.927
Artistic ability × Stimulation	0.03	0.05	-0.07	0.13	123.8	.927
<b>Liking</b>						
Intercept	2.44	0.19	2.07	2.82	16	<.001***
Stimulation	-0.05	0.08	-0.20	0.10	35.8	.632
Creativity	-0.07	0.04	-0.16	0.01	158.3	.243
Interest in art making	0.03	0.03	-0.03	0.09	167.5	.518
Attention	0.04	0.03	-0.02	0.10	178.6	.289
Imagination before drawing	0.05	0.04	-0.02	0.12	158.6	.289
Imagination during drawing	-0.06	0.03	-0.12	0	137.3	.243
Artistic ability	0.07	0.04	0	0.14	147.7	.243
Creativity × Stimulation	-0.12	0.08	-0.28	0.04	148.2	.289
Interest × Stimulation	0.07	0.06	-0.05	0.18	137.5	.391
Attention × Stimulation	0.03	0.06	-0.08	0.15	163.7	.68
Imagine before × Stimulation	0.13	0.06	0	0.25	125.2	.243
Imagine during × Stimulation	0	0.06	-0.12	0.11	110.8	.945
Artistic ability × Stimulation	-0.01	0.06	-0.13	0.12	122.6	.945
<b>Realism</b>						
Intercept	2.17	0.16	1.85	2.49	18.3	<.001***
Stimulation	-0.19	0.09	-0.37	-0.01	101.1	.094
Creativity	-0.21	0.06	-0.32	-0.10	135.6	.002**
Interest in art making	0.05	0.04	-0.03	0.14	149.6	.278
Attention	0.05	0.04	-0.03	0.13	169.6	.278
Imagination before drawing	0.13	0.05	0.03	0.22	139.9	.029*
Imagination during drawing	0.05	0.04	-0.03	0.14	129.9	.278
Artistic ability	0.23	0.04	0.14	0.32	150	<.001***
Creativity × Stimulation	0	0.11	-0.23	0.22	127.9	.985
Interest × Stimulation	-0.08	0.08	-0.24	0.08	124.2	.373
Attention × Stimulation	0.18	0.08	0.03	0.33	156.1	.067
Imagine before × Stimulation	-0.14	0.09	-0.32	0.03	113.4	.228
Imagine during × Stimulation	-0.02	0.08	-0.17	0.13	105.8	.823
Artistic ability × Stimulation	0.12	0.08	-0.04	0.28	127.3	.228

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

Table A24

Relation between global SADA score, tDCS, and DVs for creative drawing in RFT

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.81	0.21	2.41	3.22	15.4	<.001***
Stimulation	0.04	0.06	-0.07	0.15	90.3	.486
SADA-G	0.02	0.03	-0.03	0.07	112.9	.486
Stimulation × SADA-G	0.08	0.05	-0.01	0.18	108.6	.169
<b>Creativity</b>						
Intercept	2.83	0.19	2.45	3.21	16.4	<.001***
Stimulation	0	0.07	-0.13	0.13	89.4	.985
SADA-G	0.01	0.04	-0.07	0.08	126.1	.985
Stimulation × SADA-G	0.08	0.06	-0.04	0.19	100.4	.381
<b>Skill</b>						
Intercept	2.47	0.19	2.11	2.84	15.9	<.001***
Stimulation	0.06	0.05	-0.04	0.17	90.6	.286
SADA-G	0.08	0.03	0.03	0.14	129.4	.01*
Stimulation × SADA-G	0.04	0.05	-0.05	0.13	100.6	.334
<b>Liking</b>						

Intercept	2.47	0.19	2.10	2.84	15.8	<.001***
Stimulation	0	0.07	-0.14	0.14	29.4	.982
SADA-G	0.01	0.03	-0.05	0.08	119.8	.966
Stimulation × SADA-G	0.07	0.06	-0.04	0.18	103.3	.433
<b>Realism</b>						
Intercept	2.16	0.17	1.84	2.49	19.7	<.001***
Stimulation	0	0.09	-0.16	0.17	90.8	.963
SADA-G	0.15	0.05	0.05	0.25	132.7	.007**
Stimulation × SADA-G	-0.01	0.08	-0.16	0.13	100	.963

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

Table A25

Relation between SADA, tDCS, and DVs for creative drawing in RFT

Predictors	Estimate	SE	95% CI		$df$	$P_{adj}$
			LL	UL		
<b>Aesthetic Quality</b>						
Intercept	2.82	0.21	2.41	3.22	15.3	<.001***
Stimulation	0.04	0.06	-0.07	0.15	92.1	.743
Drawing from observation	0.05	0.04	-0.02	0.12	162	.562
Using perspective and shading	0.05	0.04	-0.03	0.13	171.9	.562
Confidence in mark making	-0.04	0.04	-0.11	0.04	139.6	.562
Using contrast and tone	-0.04	0.04	-0.12	0.04	165.2	.562
Technical drawing	-0.01	0.03	-0.06	0.04	161.9	.769
Realistic copying	0	0.03	-0.05	0.06	150.8	.922
Drawing from observation × Stimulation	0.08	0.07	-0.06	0.21	160.7	.562
Using perspective × Stimulation	-0.04	0.08	-0.21	0.12	170.4	.769
Confidence in marks × Stimulation	-0.11	0.07	-0.25	0.04	137.2	.562
Using contrast × Stimulation	-0.01	0.08	-0.17	0.15	163.3	.922
Technical drawing × Stimulation	0.01	0.05	-0.09	0.11	159.7	.922
Realistic copying × Stimulation	0.13	0.06	0.02	0.25	149.2	.154
<b>Creativity</b>						
Intercept	2.83	0.19	2.46	3.21	16.2	<.001***
Stimulation	0.01	0.06	-0.12	0.13	92.7	.899
Drawing from observation	0.09	0.05	0	0.18	173.7	.203
Using perspective and shading	0.05	0.05	-0.06	0.16	179	.632
Confidence in mark making	-0.04	0.05	-0.13	0.06	158.4	.632
Using contrast and tone	0.01	0.05	-0.09	0.12	176.9	.899
Technical drawing	-0.03	0.03	-0.09	0.04	175.3	.632
Realistic copying	-0.12	0.04	-0.19	-0.04	163.9	.023*
Drawing from observation × Stimulation	0.19	0.08	0.03	0.36	150.1	.112
Using perspective × Stimulation	-0.08	0.10	-0.28	0.12	155.1	.632
Confidence in marks × Stimulation	0.11	0.09	-0.06	0.28	120.1	.499
Using contrast × Stimulation	-0.17	0.10	-0.37	0.03	147.4	.263
Technical drawing × Stimulation	0.04	0.06	-0.08	0.16	141.6	.632
Realistic copying × Stimulation	0.01	0.07	-0.13	0.14	134.2	.899
<b>Skill</b>						
Intercept	2.47	0.19	2.11	2.84	15.7	<.001***
Stimulation	0.07	0.05	-0.03	0.18	88.8	.336
Drawing from observation	0.08	0.04	0.01	0.15	172.5	.188
Using perspective and shading	0.09	0.04	0	0.17	178.8	.191
Confidence in mark making	-0.06	0.04	-0.13	0.02	155.6	.336
Using contrast and tone	-0.05	0.04	-0.13	0.04	176.1	.48
Technical drawing	-0.03	0.03	-0.08	0.03	174	.48
Realistic copying	0.03	0.03	-0.04	0.09	161.3	.537
Drawing from observation × Stimulation	0.03	0.07	-0.11	0.16	149.2	.683
Using perspective × Stimulation	0.04	0.08	-0.12	0.21	154.9	.664
Confidence in marks × Stimulation	-0.10	0.07	-0.24	0.04	118.6	.336
Using contrast × Stimulation	-0.07	0.08	-0.24	0.09	146.8	.524
Technical drawing × Stimulation	0.03	0.05	-0.07	0.12	140.8	.664

Realistic copying × Stimulation	0.12	0.06	0.01	0.23	132.8	.188
<b>Liking</b>						
Intercept	2.48	0.19	2.10	2.85	15.8	<.001***
Stimulation	0.01	0.07	-0.14	0.15	31.1	.918
Drawing from observation	0	0.04	-0.08	0.09	169.9	.918
Using perspective and shading	0.07	0.05	-0.03	0.17	176.4	.563
Confidence in mark making	-0.02	0.05	-0.11	0.07	151.3	.918
Using contrast and tone	0.02	0.05	-0.08	0.12	172.9	.918
Technical drawing	-0.05	0.03	-0.11	0.02	169.8	.563
Realistic copying	-0.04	0.04	-0.11	0.03	156.1	.563
Drawing from observation × Stimulation	0.17	0.08	0.01	0.33	156.3	.268
Using perspective × Stimulation	-0.12	0.10	-0.32	0.08	162.1	.563
Confidence in marks × Stimulation	-0.02	0.09	-0.19	0.14	129.5	.918
Using contrast × Stimulation	-0.03	0.10	-0.22	0.16	155.5	.918
Technical drawing × Stimulation	0.04	0.06	-0.08	0.16	150.2	.918
Realistic copying × Stimulation	0.03	0.07	-0.10	0.17	139.9	.918
<b>Realism</b>						
Intercept	2.15	0.17	1.83	2.47	18.9	<.001***
Stimulation	0.02	0.09	-0.15	0.19	91.4	.807
Drawing from observation	0.05	0.06	-0.07	0.17	172.7	.577
Using perspective and shading	0.20	0.07	0.06	0.35	178.8	.048*
Confidence in mark making	-0.05	0.07	-0.18	0.08	157.7	.577
Using contrast and tone	-0.07	0.07	-0.22	0.07	176.5	.531
Technical drawing	-0.09	0.05	-0.18	0	175.6	.306
Realistic copying	0.07	0.05	-0.03	0.17	166	.499
Drawing from observation × Stimulation	-0.18	0.11	-0.41	0.04	147.1	.393
Using perspective × Stimulation	0.07	0.14	-0.20	0.34	152.9	.699
Confidence in marks × Stimulation	-0.12	0.12	-0.35	0.11	116.5	.531
Using contrast × Stimulation	0.04	0.14	-0.23	0.30	144.4	.807
Technical drawing × Stimulation	0.08	0.08	-0.08	0.24	138.5	.531
Realistic copying × Stimulation	0.11	0.09	-0.07	0.29	131.8	.528

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A26**

*Relation between OFPT, tDCS, and DVs for realistic drawing in RFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.25	0.21	1.83	2.67	23.3	<.001***
Stimulation	0.04	0.07	-0.10	0.17	30.4	.608
OFPT	0.03	0.02	-0.01	0.07	58	.135
Stimulation × OFPT	0.03	0.02	-0.01	0.07	30.9	.135
<b>Skill</b>						
Intercept	2.45	0.21	2.04	2.87	19.2	<.001***
Stimulation	-0.12	0.08	-0.28	0.03	17.5	.184
OFPT	0.03	0.02	0	0.07	57.2	.178
Stimulation × OFPT	0.02	0.02	-0.02	0.06	31.4	.412
<b>Stereotypicality</b>						
Intercept	3.49	0.36	2.78	4.20	17	<.001***
Stimulation	0.10	0.11	-0.11	0.31	30.3	.462
OFPT	0.07	0.02	0.02	0.12	53.1	.02*
Stimulation × OFPT	0	0.03	-0.06	0.07	32.4	.918
<b>Realism (Externally Cued)</b>						
Intercept	2.53	0.17	2.20	2.87	26.5	<.001***
Stimulation	-0.11	0.09	-0.29	0.07	29.3	.319
OFPT	0.08	0.02	0.03	0.12	56.8	.003**
Stimulation × OFPT	-0.02	0.03	-0.07	0.04	30.8	.567

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;

*df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table A27**

*Relation between personality, tDCS, and DVs for realistic drawing in RFT*

Predictors	Estimate	SE	95% CI		<i>df</i>	<i>P</i> <sub>adj</sub>
			<i>LL</i>	<i>UL</i>		
<b>Realism (Internally Cued)</b>						
Intercept	2.25	0.21	1.83	2.67	23.1	<.001***
Stimulation	0.06	0.06	-0.07	0.18	33.2	.593
Extraversion	0.02	0.04	-0.05	0.09	58.8	.721
Agreeableness	0.01	0.05	-0.09	0.10	58.6	.881
Conscientiousness	-0.08	0.04	-0.16	0	49.9	.255
Neuroticism	0.01	0.04	-0.07	0.10	55.2	.805
Openness	0.04	0.04	-0.04	0.12	58.9	.561
Extraversion × Stimulation	-0.04	0.04	-0.11	0.03	31.2	.561
Agreeableness × Stimulation	0.03	0.04	-0.05	0.11	36	.593
Conscientiousness × Stimulation	0.04	0.05	-0.06	0.15	36.4	.593
Neuroticism × Stimulation	-0.05	0.03	-0.12	0.02	31.6	.45
Openness × Stimulation	0.07	0.04	-0.01	0.14	34.4	.341
<b>Skill</b>						
Intercept	2.45	0.21	2.04	2.87	19.5	<.001***
Stimulation	-0.09	0.08	-0.24	0.06	16.2	.493
Extraversion	0.06	0.03	-0.01	0.12	57.9	.493
Agreeableness	-0.01	0.04	-0.10	0.07	51.4	.831
Conscientiousness	-0.04	0.04	-0.12	0.03	54.9	.493
Neuroticism	0.04	0.04	-0.04	0.12	46.9	.493
Openness	0.04	0.04	-0.03	0.12	57.5	.493
Extraversion × Stimulation	0	0.04	-0.08	0.07	31	.939
Agreeableness × Stimulation	0.02	0.04	-0.07	0.10	34.5	.831
Conscientiousness × Stimulation	0.02	0.06	-0.09	0.13	36.7	.831
Neuroticism × Stimulation	-0.04	0.04	-0.11	0.04	30.4	.493
Openness × Stimulation	0.06	0.04	-0.02	0.14	32.8	.493
<b>Stereotypicality</b>						
Intercept	3.50	0.36	2.78	4.21	17.5	<.001***
Stimulation	0.12	0.10	-0.07	0.31	32	.713
Extraversion	0.01	0.05	-0.09	0.10	56.5	.877
Agreeableness	0.04	0.06	-0.08	0.15	49.2	.729
Conscientiousness	-0.05	0.05	-0.16	0.06	55.5	.729
Neuroticism	0.03	0.05	-0.07	0.14	44.7	.729
Openness	0.05	0.05	-0.05	0.16	55.8	.728
Extraversion × Stimulation	-0.01	0.05	-0.12	0.09	30.3	.857
Agreeableness × Stimulation	-0.11	0.06	-0.24	0.01	33.6	.445
Conscientiousness × Stimulation	-0.13	0.08	-0.28	0.03	35.9	.498
Neuroticism × Stimulation	0.02	0.05	-0.09	0.12	30.3	.857
Openness × Stimulation	0.05	0.06	-0.07	0.16	32.3	.729
<b>Realism (Externally Cued)</b>						
Intercept	2.53	0.18	2.18	2.88	28.8	<.001***
Stimulation	-0.11	0.08	-0.27	0.05	30.8	.332
Extraversion	-0.06	0.04	-0.14	0.03	59.2	.332
Agreeableness	0.04	0.05	-0.07	0.14	53.9	.691
Conscientiousness	-0.01	0.05	-0.10	0.09	52.4	.882
Neuroticism	-0.02	0.05	-0.12	0.08	48.6	.811
Openness	0.11	0.05	0.02	0.20	59	.154
Extraversion × Stimulation	-0.04	0.05	-0.13	0.05	28.7	.552
Agreeableness × Stimulation	0.02	0.05	-0.08	0.12	32.9	.811
Conscientiousness × Stimulation	-0.09	0.07	-0.23	0.04	34	.332
Neuroticism × Stimulation	-0.07	0.05	-0.15	0.02	29.3	.332
Openness × Stimulation	0.07	0.05	-0.03	0.16	31.3	.332

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

**Table A28***Relation between global CIAI score, tDCS, and DVs for realistic drawing in RFT*

Predictors	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.24	0.21	1.82	2.66	23.8	<.001***
Stimulation	0.02	0.07	-0.12	0.15	30.2	.81
CIAI-G	0.02	0.07	-0.11	0.15	46.8	.81
Stimulation × CIAI-G	0.12	0.08	-0.05	0.28	31.3	.35
<b>Skill</b>						
Intercept	2.44	0.21	2.03	2.86	19.5	<.001***
Stimulation	-0.15	0.07	-0.29	-0.01	30.3	.077
CIAI-G	0.09	0.06	-0.03	0.22	53.9	.185
Stimulation × CIAI-G	0.10	0.09	-0.07	0.27	32.4	.268
<b>Stereotypicality</b>						
Intercept	3.49	0.36	2.78	4.20	17.5	<.001***
Stimulation	0.06	0.11	-0.15	0.28	30.5	.68
CIAI-G	0.05	0.09	-0.12	0.23	58.3	.68
Stimulation × CIAI-G	0.05	0.13	-0.20	0.31	34.7	.68
<b>Realism (Externally Cued)</b>						
Intercept	2.53	0.18	2.17	2.88	30.5	<.001***
Stimulation	-0.15	0.09	-0.33	0.03	30	.215
CIAI-G	0.05	0.08	-0.11	0.21	52.9	.557
Stimulation × CIAI-G	0.12	0.11	-0.09	0.34	32.1	.352

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit; df = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A29***Relation between CIAI, tDCS, and DVs for realistic drawing in RFT*

Predictors	Estimate	SE	95% CI		df	<i>p</i> <sub>adj</sub>
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.25	0.20	1.86	2.65	19.6	<.001***
Stimulation	-0.06	0.08	-0.23	0.10	26.6	.748
Creativity	-0.08	0.06	-0.20	0.04	43.1	.667
Interest in art making	-0.04	0.05	-0.14	0.05	53.7	.748
Attention	0.03	0.05	-0.06	0.12	51.4	.748
Imagination before drawing	-0.01	0.05	-0.12	0.09	54.4	.844
Imagination during drawing	0.02	0.05	-0.09	0.12	57.6	.844
Artistic ability	0.27	0.06	0.15	0.38	56.4	<.001***
Creativity × Stimulation	0.10	0.11	-0.12	0.32	39.3	.748
Interest × Stimulation	-0.05	0.08	-0.20	0.10	30.8	.748
Attention × Stimulation	-0.02	0.08	-0.18	0.14	37.4	.844
Imagine before × Stimulation	-0.03	0.08	-0.19	0.13	27.3	.844
Imagine during × Stimulation	0.10	0.07	-0.04	0.23	23.8	.667
Artistic ability × Stimulation	-0.07	0.08	-0.23	0.09	26.4	.748
<b>Skill</b>						
Intercept	2.45	0.21	2.04	2.85	18.1	<.001***
Stimulation	-0.15	0.09	-0.32	0.02	19	.396
Creativity	0.03	0.06	-0.08	0.14	42	.768
Interest in art making	-0.06	0.04	-0.15	0.02	53.4	.459
Attention	0.05	0.04	-0.04	0.13	53	.598
Imagination before drawing	-0.05	0.05	-0.15	0.05	53.2	.598
Imagination during drawing	0.01	0.05	-0.08	0.11	56.1	.769
Artistic ability	0.19	0.05	0.09	0.29	57.2	.004**
Creativity × Stimulation	0.04	0.11	-0.18	0.25	37.7	.769
Interest × Stimulation	-0.05	0.07	-0.19	0.09	30.3	.727
Attention × Stimulation	0.05	0.08	-0.10	0.20	39	.727
Imagine before × Stimulation	-0.07	0.08	-0.23	0.08	27	.639
Imagine during × Stimulation	0.11	0.07	-0.02	0.24	24	.396
Artistic ability × Stimulation	0.03	0.08	-0.12	0.18	27.7	.769

<b>Stereotypicality</b>						
Intercept	3.53	0.36	2.82	4.24	17.4	<.001***
Stimulation	0.02	0.11	-0.19	0.24	32.9	.884
Creativity	-0.06	0.08	-0.21	0.09	45.5	.807
Interest in art making	0.02	0.06	-0.11	0.14	53.6	.884
Attention	-0.04	0.06	-0.16	0.08	51.6	.807
Imagination before drawing	0.04	0.07	-0.09	0.18	54.4	.807
Imagination during drawing	-0.02	0.07	-0.17	0.12	58.5	.884
Artistic ability	0.16	0.08	0.01	0.31	55.6	.312
Creativity × Stimulation	0.14	0.14	-0.14	0.42	43.1	.807
Interest × Stimulation	0.05	0.10	-0.14	0.24	36.3	.807
Attention × Stimulation	0	0.11	-0.20	0.21	40.8	.973
Imagine before × Stimulation	-0.10	0.10	-0.30	0.10	32.5	.807
Imagine during × Stimulation	-0.08	0.09	-0.26	0.10	29.8	.807
Artistic ability × Stimulation	-0.07	0.11	-0.28	0.15	31.2	.807
<b>Realism (Externally Cued)</b>						
Intercept	2.56	0.17	2.22	2.89	27.2	<.001***
Stimulation	-0.12	0.09	-0.30	0.06	32.7	.376
Creativity	0.03	0.07	-0.10	0.16	41.8	.696
Interest in art making	-0.04	0.05	-0.15	0.06	50.2	.482
Attention	-0.05	0.05	-0.15	0.05	50.6	.445
Imagination before drawing	-0.15	0.06	-0.27	-0.03	50.7	.088
Imagination during drawing	0.12	0.06	0	0.25	59.2	.136
Artistic ability	0.21	0.07	0.08	0.34	57.5	<b>.017*</b>
Creativity × Stimulation	0.27	0.12	0.03	0.51	40.5	.102
Interest × Stimulation	-0.19	0.08	-0.35	-0.03	35.2	.089
Attention × Stimulation	0.08	0.09	-0.09	0.26	40.1	.445
Imagine before × Stimulation	-0.10	0.09	-0.28	0.07	31.5	.408
Imagine during × Stimulation	0.01	0.07	-0.13	0.15	29.9	.889
Artistic ability × Stimulation	0.10	0.09	-0.07	0.27	31.7	.408

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A30**

*Relation between global SADA score, tDCS, and DVs for realistic drawing in RFT*

Predictors	Estimate	SE	95% CI		$df$	$p_{adj}$
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.25	0.21	1.83	2.66	22.8	<.001***
Stimulation	0	0.07	-0.13	0.13	30.5	.963
SADA-G	0.17	0.06	0.04	0.29	59	<b>.021*</b>
Stimulation × SADA-G	0.03	0.06	-0.09	0.15	30.5	.865
<b>Skill</b>						
Intercept	2.45	0.21	2.03	2.86	19	<.001***
Stimulation	-0.16	0.07	-0.29	-0.03	30.4	<b>.036*</b>
SADA-G	0.15	0.06	0.04	0.26	56.5	<b>.016*</b>
Stimulation × SADA-G	0.02	0.06	-0.10	0.14	31.2	.784
<b>Stereotypicality</b>						
Intercept	3.49	0.36	2.77	4.20	17.4	<.001***
Stimulation	0.06	0.10	-0.14	0.26	30.3	.546
SADA-G	0.08	0.08	-0.08	0.23	53.7	.462
Stimulation × SADA-G	0.17	0.09	-0.02	0.35	30.9	.172
<b>Realism (Externally Cued)</b>						
Intercept	2.53	0.18	2.18	2.88	30.3	<.001***
Stimulation	-0.16	0.09	-0.33	0.01	30.4	.121
SADA-G	0.13	0.08	-0.02	0.28	58.9	.121
Stimulation × SADA-G	0.10	0.08	-0.06	0.25	30.6	.222

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; LL = lower limit; UL = upper limit;  $df$  = degrees of freedom.  $p$ -values were adjusted based on Benjamini & Hochberg (1995).

**Table A31***Relation between SADA, tDCS, and DVs for realistic drawing in RFT*

Predictors	Estimate	SE	95% CI		df	P <sub>adj</sub>
			LL	UL		
<b>Realism (Internally Cued)</b>						
Intercept	2.25	0.21	1.83	2.67	23.5	<.001***
Stimulation	0.02	0.06	-0.09	0.13	884	.779
Drawing from observation	0.14	0.06	0.03	0.24	556.2	.101
Using perspective and shading	-0.04	0.06	-0.17	0.08	600.3	.779
Confidence in mark making	0.06	0.07	-0.07	0.20	233.1	.779
Using contrast and tone	-0.02	0.06	-0.15	0.11	542.4	.779
Technical drawing	0.01	0.04	-0.07	0.10	378.1	.779
Realistic copying	-0.03	0.05	-0.14	0.08	242	.779
Drawing from observation × Stimulation	0.07	0.09	-0.11	0.24	662.1	.779
Using perspective × Stimulation	-0.06	0.10	-0.26	0.14	807.5	.779
Confidence mark making × Stimulation	0.07	0.08	-0.08	0.22	885.4	.779
Using contrast × Stimulation	0.11	0.10	-0.08	0.31	801.4	.779
Technical drawing × Stimulation	0.02	0.06	-0.09	0.14	860.4	.779
Realistic copying × Stimulation	-0.15	0.07	-0.28	-0.02	795	.108
<b>Skill</b>						
Intercept	2.46	0.21	2.05	2.86	17.2	<.001***
Stimulation	-0.12	0.09	-0.29	0.05	16.9	.471
Drawing from observation	0.14	0.06	0.02	0.26	56.3	.167
Using perspective and shading	0.07	0.07	-0.07	0.21	56.4	.562
Confidence in mark making	-0.09	0.07	-0.22	0.05	52.7	.471
Using contrast and tone	0	0.07	-0.14	0.14	56.9	.984
Technical drawing	-0.06	0.05	-0.15	0.03	58	.471
Realistic copying	0.02	0.05	-0.09	0.12	55.9	.953
Drawing from observation × Stimulation	0.15	0.11	-0.06	0.37	38.3	.471
Using perspective × Stimulation	-0.16	0.13	-0.41	0.10	38.8	.471
Confidence mark making × Stimulation	0.07	0.11	-0.15	0.29	25.9	.825
Using contrast × Stimulation	-0.06	0.13	-0.31	0.19	35.2	.88
Technical drawing × Stimulation	0.02	0.08	-0.14	0.17	32.4	.976
Realistic copying × Stimulation	-0.01	0.09	-0.17	0.16	30.5	.984
<b>Stereotypicality</b>						
Intercept	3.48	0.36	2.77	4.19	17.2	<.001***
Stimulation	0.09	0.10	-0.11	0.28	31	.793
Drawing from observation	-0.03	0.09	-0.20	0.14	55.2	.894
Using perspective and shading	0.16	0.10	-0.04	0.36	51.9	.564
Confidence in mark making	0.02	0.10	-0.17	0.21	59.1	.894
Using contrast and tone	-0.01	0.10	-0.21	0.19	54.1	.894
Technical drawing	-0.11	0.06	-0.23	0.02	56.6	.564
Realistic copying	-0.01	0.08	-0.17	0.14	57.2	.894
Drawing from observation × Stimulation	0.14	0.14	-0.14	0.42	44.2	.793
Using perspective × Stimulation	-0.10	0.17	-0.45	0.24	40	.867
Confidence mark making × Stimulation	0.04	0.14	-0.23	0.30	33.3	.894
Using contrast × Stimulation	0.10	0.17	-0.23	0.43	39.6	.867
Technical drawing × Stimulation	0.13	0.10	-0.07	0.33	37.2	.77
Realistic copying × Stimulation	-0.11	0.12	-0.34	0.12	37.1	.793
<b>Realism (Externally Cued)</b>						
Intercept	2.54	0.18	2.18	2.90	30.3	<.001***
Stimulation	-0.16	0.07	-0.29	-0.02	29.4	.147
Drawing from observation	0.21	0.07	0.08	0.35	41.3	.022*
Using perspective and shading	0.10	0.08	-0.05	0.25	39.6	.386
Confidence in mark making	-0.05	0.08	-0.21	0.11	53.5	.786
Using contrast and tone	-0.03	0.08	-0.18	0.13	41.3	.846
Technical drawing	-0.01	0.05	-0.11	0.09	46.3	.96
Realistic copying	-0.06	0.07	-0.19	0.07	52.4	.622
Drawing from observation × Stimulation	-0.21	0.11	-0.42	0	37.3	.167
Using perspective × Stimulation	-0.11	0.13	-0.36	0.14	33.3	.622
Confidence mark making × Stimulation	0	0.10	-0.19	0.19	29.4	.988
Using contrast × Stimulation	0.26	0.12	0.02	0.50	33.4	.151
Technical drawing × Stimulation	-0.04	0.07	-0.18	0.11	31.4	.811
Realistic copying × Stimulation	0.15	0.08	-0.02	0.32	31.7	.197

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < 0.01$ ; \*\*\* indicates  $p < .001$ . DV = dependent variable; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *df* = degrees of freedom. *p*-values were adjusted based on Benjamini & Hochberg (1995).

### Comparison of veracity indicators

**Table A32**

*Comparison of veracity indicators between studies, experimental groups, and conditions*

	<i>α</i> Artworks		<i>α</i> Judges	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<b>Pelowski et al. (2019)</b>				
<b>'Prior'</b>	<b>0.53</b>	<b>0.13</b>	<b>0.73</b>	<b>0.06</b>
<b>LFT</b>				
Total	0.61	0.22	0.74	0.24
Stimulation	0.32	0.30	0.73	0.21
Sham	0.62	0.11	0.76	0.17
<b>RFT</b>				
Total	0.59	0.18	0.77	0.15
Stimulation	0.56	0.14	0.80	0.11
Sham	0.29	0.41	0.64	0.25