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Title: Stimulating the Social Brain

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Methods and Procedures

This study will involve two sessions, completed approximately one week apart. The sessions will be identical except that one session will involve active neurostimulation and the other will involve sham stimulation. We will use a double-blind, cross-over procedure so that across participants the sham session will be equally likely to have occurred first or second and so that both participants and experimenters will be unaware of which session includes the active simulation.

After providing written informed consent, participants will complete two short self-report measures of paranoid thinking:

1) The Paranoia Scale (PS; Fenigstein & Vanable, 1992) is a self-report measure designed to assess sub-clinical paranoid thought. Scores range from 20-100 with higher scores indicating higher levels of sub-clinical paranoia. 3 minutes.

2) The State Social Paranoia Scale (SSPS; Freeman et al., 2007). The SSPS is a psychometrically sound 20-item self- report measure assessing current levels of paranoid, positive, and neutral thinking about others. Participants read each statement and rate how much they agree on a scale from 1-5. 3 minutes

Participants will then begin the neurostimulation portion of the session, which will last for 20 minutes. The participant will be set up with the tDCS material that will start real or sham stimulation, and participants will be informed that they may read or otherwise entertain themselves during this portion of the study. The two electrodes of the tDCS will be placed over the left and right ventrolateral prefrontal cortex. For active stimulation the electrical current will be initially increased in a ramp-like fashion over several seconds (5 seconds) until reaching 1.5mA, and stimulation will be maintained for 20 minutes until it ramps down (5 seconds). For sham stimulation, the electrical current will be increased in a ramp-like fashion over several seconds (5 seconds) until reaching 1.5mA to mimic the sensation present during the first 5 seconds of real stimulation, and then stimulation will be stopped without the participant knowing. The total duration of the sham tDCS will be identical to the active condition in order to appropriately blind the procedure.

Following the neurostimulation portion, the participant will be asked to sit quietly for 30 minutes. After that time has elapsed, the participant will complete the following behavioral measures in a random order:

1) Trustworthiness Task (Adolphs, Tranel, & Damasio, 1998). In this task, participants rate 42 faces for trustworthiness on a scale from -3 to 3. Faces are presented in grayscale and represent ethnically diverse males and females. 4 minutes.

2) Emotion Recognition 40 (ER-40; Kohler, Turner, Bilker, Brinsinger, Siegel, Kanes… Gur, 2003). The ER-40 is a standardized, computer administered measure of facial affect recognition ability. It includes 40 color photographs of faces expressing 4 basic emotions (i.e. happiness, sadness, anger or fear) and neutral expressions. Participants view one face at a time and are asked to choose the correct emotion for each face. 3 minutes

3) Ambiguous Intentions and Hostility Questionnaire (AIHQ) (Combs, Penn, Wicher, & Waldheter, 2007). The AIHQ is a paper-and-pencil measure designed to evaluate hostile

social cognitive biases. It is comprised of 15 hypothetical situations which reflect causes that are either ambiguous, intentional, or accidental (e.g. ambiguous: “you walk past a group of teenagers and you hear them start to laugh”). Participants are asked to read each situation, imagine that it has happened to them, and to write a reason why it happened. They are also asked to record how they would respond to each situation. 6 minutes.

4) Intentionality Bias Task (IBT; Peyroux, Strickland, Tapiero, & Franck, 2014). This measure assesses the tendency to attribute intentionality to the actions of others. Participants read 36 very brief descriptions of actions (e.g. "Mark slipped on the walkway") and then rate whether the action was intentional or unintentional. 5 minutes.

5) Achievement and Relationships Attribution Task (ARAT; fornells-Ambrojo & Garety, 2009). The ARAT consists of 12 scenarios that describe everyday events (e.g., a first date that does not go well), and participants are asked to answer a question about the outcome of the event. Responses are rated for the type of attribution that is made. 10 minutes.

6) The Beck Depression Inventory-2 (BDI-2; Beck et al., 1996) is a 21-item self-report scale that assesses the severity of depressive symptoms. The BDI-2 has excellent psychometric properties and is used extensively in psychological research. Higher scores indicate more severe depression. 3 minutes.

7) The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a 10-item self-report measure used to assess level of self-esteem. Responses are made using a Likert scale from 1-4, and higher scores indicate higher levels of self-esteem. The RSES shows good internal consistency (α=.92) and convergent validity. 3 minutes.

8) Brief Core Schema Scales (BCSS; Fowler et al., 2006). The BCSS is a short self-report measure of positive and negative evaluations of the self and others. It has good psychometric properties and has more independence from mood state than other similar measures. 3 minutes.

9) The Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) is a 21-item self-report measure of the related negative emotion states of depression, anxiety, and tension/stress. 3 minutes

10) PS & SSPS - see descriptions above.

At the end of the session, we will ask participants to report which session they believed they just received. This will allow us to assess the success of our blinding procedure.

A repeated-measures ANOVAs will be used to compare indices of paranoia and related constructs between stimulation conditions.