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Supporting Online Material for

Dopaminergic Network Differences in Human Impulsivity

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Supporting Online Material

Materials and Methods

Participants

32 participants (mean age = 22.59 years, 16 male) were studied as part of an ongoing investigation of individual differences in striatal and extrastriatal DA release. All participants were medically and psychiatrically healthy adults, age 18 to 35, with estimated IQ greater than 80. Subjects were excluded if they had any history of substance abuse, current tobacco use, alcohol intake greater than 8 ounces of whiskey or equivalent per week, use of psychostimulants (excluding caffeine) more than twice in the subject's lifetime or at all in past 6 months, any psychotropic medication for the past 6 months other than occasional use of benzodiazepines for sleep, history of psychiatric illness, significant medical condition, any condition which would interfere with MRI or PET studies (e.g., extreme obesity, claustrophobia, cochlear implant, metal fragments in eyes, cardiac pacemaker, neural stimulator, and metallic body inclusions or other metal implanted in the body which may interfere with MRI scanning, pregnancy, or anemia). Female participants were studied during the early follicular phase of their menstrual cycle.

Following initial screening, subjects were given an interview of their medical history and a structured psychiatric interview (SCID-NP;(*SI*)). In addition to the regular questions in the non-alcohol substance dependence section of the SCID-NP, subjects were asked to indicate the number of times that they have taken any drug that they reported having tried, and asked to indicate any usage within the last 2 months. Any illicit drug use in the last 2 months was grounds for exclusion, even in subjects who did not

otherwise meet criteria for substance abuse. Urine drug screens were performed to test for the presence of amphetamines, cocaine, marijuana, PCP, and opiates, benzodiazepines, and barbiturates.

Personality and Behavioral Measures

Impulsivity was assessed with the 30-item Barratt Impulsiveness Scale, version 11 (BIS-11)(*S2*), which is one of the most widely used self-report measures of impulsive personality traits(*S3-S12*). In our sample of 32 subjects, BIS-11 scores ranged from 43 to 86, with a mean (standard deviation) of 59.47 (10.95). To measure subjective responses to amphetamine, we administered the Drug Effects Questionnaire (DEQ) at 60-minute intervals following the administration of drug and placebo. The DEQ consists of four questions: whether the subject feels the drug, whether the subject likes the drug, whether the subject feels high, and whether the subject wants more of the drug. Subjects indicated their response on a labeled magnitude scale (*S13*) from 0-100, with 0 indicating "Not At All" and 100 indicating "Most Imaginable." We used peak responses on the amphetamine day for our correlations with amphetamine-induced DA release.

PET

Image Acquisition and Analysis: All PET images were acquired using [^{18}F]fallypride. ((*S*)-*N*-[(1-allyl-2-pyrrolidinyl)methyl]-5-(3[^{18}F]fluoropropyl)-2,3-dimethoxybenzamide), a substituted benzamide with very high affinity for D2/D3 receptors(*S14*). Unlike other D2/D3 ligands, [^{18}F]fallypride allows stable estimates of D2-like binding in both striatal and extrastriatal regions(*S*15). Our current resolution (see below) allows visualization of [18F]fallypride binding potential in the substantia nigra (SN)/ventral tegmental area