**Supplementary Information**

**Supplementary Methods**

**Supplementary Figures**

Figure S1 Flow diagram of the selection of addiction iFC studies.

Figure S2 Comparisons in rs-FC findings of depressant user (Panel A), stimulant user (Panel B), and distinct alteration patterns in rs-FC network between depressant user and stimulant user (Panel C).

**Supplementary Tables**

Table S1 Alterations of intrinsic functional connectivity between depressant user, stimulant user, and their contrast results

Table S2 Summary of Seed-Networks and Seed ROIs of Studies Included in Meta-analysis

Table S3 Demographic and clinical characteristics of substance use disorder (SUD) included in the Meta-analysis

Table S4 Demographic and clinical characteristics of behavioral addictions (BA) included in the Meta-analysis

Table S5 Summary of Methods Implemented in Studies Included in Meta-analysis

Table S6 Results of Jackknife Sensitivity Analysis of Addiction-HC

Table S7 Results of Jackknife Sensitivity Analysis of BA-HC

Table S8 Results of Jackknife Sensitivity Analysis of SUD-HC

Table S9 Publication bias of the clusters in rs-FC meta-analysis

**Included Datasets**

**Supplementary Methods**

**Details of literature search**

Firstly, a comprehensive search strategy was combined by MeSH term and free text words described in the bellowing in the four electronic database, PubMed, OVID Embase, OVID Medline, and Web of Science:

(((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND ("Behavior, Addictive"[MeSH] OR "Oncogene Addiction"[MeSH] OR "Addiction Medicine"[MeSH] OR "Substance-Related Disorders"[MeSH] OR "Opioid-Related Disorders"[MeSH] OR "Munchausen Syndrome"[MeSH] OR "Cocaine-Related Disorders"[MeSH] OR "Amphetamine-Related Disorders"[MeSH] OR "Tobacco Use Disorder"[MeSH] OR "Morphine Dependence"[MeSH] OR "Heroin Dependence"[MeSH] OR "Alcoholism"[MeSH] OR "Narcotic-Related Disorders"[MeSH] OR "Opium Dependence"[MeSH] OR "Internet Addiction Disorder"[MeSH]) AND resting state

After searching this comprehensive search strategy, search strategy about single type of addiction was conducted:

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND ((((((((((((((Substance-Related Disorders[MeSH Terms]) OR (Substance Use)) OR (Substance Uses)) OR (Use, Substance)) OR (Drug Abuse)) OR (Abuse, Drug)) OR (Drug Dependence)) OR (Dependence, Drug)) OR (Drug Addiction)) OR (Addiction, Drug)) OR (Substance Use Disorders)) OR (Disorder, Substance Use)) OR (Organic Mental Disorders, Substance-Induced)) OR (Substance Abuse))) AND (resting state)

(((((("Cocaine"[MeSH]) OR (Cocaine Hydrochloride)) OR (Hydrochloride, Cocaine)) OR (Cocaine HCl)) OR (HCl, Cocaine)) AND (((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI))) AND (resting state)

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND ((((((Cannabis[MeSH Terms]) OR (Cannabi[MeSH Terms])) OR (Marijuana[MeSH Terms])) OR (Hemp[MeSH Terms])) OR (Bhang[MeSH Terms])) OR (Ganja[MeSH Terms]))) AND (resting state)

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND ((((((((((Amphetamine[MeSH Terms]) OR (Amfetamine)) OR (Phenopromin)) OR (Desoxynorephedrin)) OR (Phenamine)) OR (Centramina)) OR (Fenamine)) OR (Mydrial)) OR (Amphetamine Sulfate)) OR (l-Amphetamine))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND ((((((Methamphetamine[MeSH Terms]) OR (Desoxyephedrine)) OR (Metamfetamine)) OR (Methylamphetamine)) OR (Deoxyephedrine)) OR (Methamphetamine Hydrochloride))) AND (resting state)

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND (((((((Heroin[MeSH Terms]) OR (Diacetylmorphine)) OR (Diamorphine)) OR (Diagesil)) OR (Min-I-Jet Morphine Sulphate)) OR (Heroin Hydrochloride)) OR (Diacetylmorphine Hydrochloride))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND (((((((Analgesics, Opioid[MeSH Terms]) OR (Opioid Analgesics)) OR (Analgesic, Opioid)) OR (Opioids)) OR (Partial Opioid Agonists)) OR (Full Opioid Agonists)) OR (Opioid Mixed Agonist-Antagonists))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND (((((((abuse, alcohol[MeSH Terms]) OR (Alcohol Dependence)) OR (Alcohol Addiction)) OR (Alcoholic Intoxication, Chronic)) OR (Alcohol Use Disorder)) OR (Alcohol Abuse)) OR (Ethanol Abuse))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND (((((((Tobacco Use Disorder[MeSH Terms]) OR (Disorder, Tobacco Use)) OR (Tobacco Use Disorders)) OR (Nicotine Addiction)) OR (Tobacco Dependence)) OR (Nicotine Dependence)) OR (Nicotine Use Disorder))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND ((((Behavior, Addictive[MeSH Terms]) OR (Addictive Behavior)) OR (Addictive Behaviors)) OR (Behaviors, Addictive))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (resting state)) AND ((((gambling[MeSH Terms]) OR (Gambling, Pathological)) OR (Pathological Gamblings)) OR (Gambling, Pathologic))

((((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI)) AND (((((((Internet Addiction Disorder[MeSH Terms]) OR (Addiction Disorder, Internet)) OR (Disorder, Internet Addiction)) OR (Internet Addiction)) OR (Social Media Addiction)) OR (Social Media Addiction)) OR (Internet Gaming Disorder))) AND (resting state)

(((((((((((compulsive buying) OR (compulsive shopping)) OR (shopping addiction)) OR (pathological shopping)) OR (shopping disorder)) OR (Internet shopping disorder)) OR (buying disorder)) OR (buying addiction)) OR (pathological buying)) OR (compulsive buying)) AND (((fmri[MeSH Terms]) OR (Functional magnetic resonance imaging)) OR (functional MRI))) AND (resting state)

Literature searches was carried out without restrictions on time of publication or publication status. Filters was used to constrain database searches to studies of human participants written in English.

**Supplementary Figures**

图示

描述已自动生成

**Figure S1** Flow diagram of the selection of addiction iFC studies.

**图片包含 文本

描述已自动生成**

**Figure S2** Comparisons in rs-FC findings of depressant user (Panel A), stimulant user (Panel B), and distinct alteration patterns in rs-FC network between depressant user and stimulant user (Panel C). The first column denotes the seed-belonging networks.

Abbreviations: AN, affective network; DMN, default mode network; FPN, frontal parietal network; SN, salience network; VN: visual network.

**Supplementary Tables**

**Table S1** Alterations of intrinsic functional connectivity between depressant user, stimulant user, and their contrast results

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seed network | Effect anatomy | Effect network | MNI coordinate | Number of voxels | SDM Z value | p value | Breakdown (Main clusters) |
| **Depressant user > HC** | | | | | | | |
| DMN | Right striatum | AN | 8, 8, -8 | 391 | -2.151 | 0.00018 | Right striatum (235) |
| **Depressant user < HC** | | | | | | | |
| FPN | Left Insular | SN | -40, 16, -8 | 904 | -3.630 | 0.00004 | Left IFG (598)  Left Insular (190) |
| AN | Left SFG | DMN | -4, 44, -6 | 160 | -2.377 | 0.00022 | Left SFG (94)  Left ACC (33) |
| **Stimulant user < HC** | | | | | | | |
| DMN | Left ACC | SN | 0, 26, 26 | 225 | -2.078 | 0.00018 | Left ACC (137)  Right ACC (33) |
| AN | Left striatum | AN | -28, -2, -6 | 790 | -2.826 | 0.00001 | Left Putamen (147)  Left amygdala (111)  Left striatum (83) |
| SN | Right ATP | FPN | 16, 2, 16 | 589 | -4.429 | <0.00001 | Right ATP (237)  Right Caudate (224) |
| Left ATP | FPN | -18, 8, 18 | 119 | -2.881 | 0.00008 | Right ATP (94)  Right Caudate (23) |
| **Stimulant user > HC** | | | | | | | |
| DMN | Right IFG | SN, FPN | 50, 14, 2 | 1305 | 3.493 | <0.00001 | Right IFG (688)  Right Insular (269)  Right RO (106) |
| Right MFG | FPN | 32, 16, 56 | 164 | 2.322 | 0.00006 | Right MFG (136) |
| Right IOG | VN | 32, -90, -4 | 101 | 2.144 | 0.00018 | Right IOG (85) |
| AN | Right SFG | DMN | 10, 66, 0 | 908 | 2.013 | 0.00002 | Right SFG (563)  Left SFG (121)  Corpus callosum (100) |
| **Stimulant user < Depressant user** | | | | | | | |
| DMN | Left ACC | SN | -2, 24, 20 | 316 | -1.855 | 0.000129 | Left ACC (212)  Right ACC (59) |
| AN | Left Putamen | AN | -28, 0, -6 | 642 | -2.449 | <0.00001 | Left Putamen (133)  Left Amygdala (97)  Left striatum (73) |
| SN | Right ATP | FPN | 16, 2, 16 | 584 | -3.883 | <0.00001 | Right ATP (244)  Right Caudate (223) |
| **Stimulant user > Depressant user** | | | | | | | |
| DMN | Right IFG | FPN | 50, 14, 2 | 438 | 2.232 | <0.00001 | Right IFG (279)  Right Insular (81) |
| AN | Right SFG | DMN | 0, 42, -6 | 1803 | 2.568 | <0.00001 | Left ACC (280)  Right SFG (560)  Left SFG (378)  Corpus callosum (232)  Left gyrus rectus (139) |

Abbreviations: ACC: anterior cingulate cortex; FG: fusiform gyrus; IFG: inferior frontal gyrus; MCC: median cingulate cortex; MFG: middle frontal gyrus; PCC: posterior cingulate cortex; SFG: superior frontal gyrus; AN, affective network; DAN, dorsal attention network; DMN, default mode network; FPN, frontal parietal network; SSN, somatosensory network; SN, salience network.

**Table S2** Summary of Seed-Networks and Seed ROIs of Studies Included in Meta-analysis

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Reference** | **Seed-Networks and Direction of Effects** | | | | | | | | | | | | | | | | | | | | | | | |
| **DMN** | | | **FPN** | | | **AN** | | | **SN** | | | **SSN** | | | **DAN** | | | **Visual** | | | **Thalamus** | | |
| **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** | **Addiction**  **>TD** | **Addiction**  **<TD** | **No**  **Sig** |
| Adinoff et al 2015 | Hippo |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bae et al., 2017 IGD | PCC |  |  | DLPFC |  |  | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bae et al., 2017 ibGD | PCC |  |  |  | DLPFC |  | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Berlingeri et al, 2017 |  |  |  |  |  |  | NAcc | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bi et al 2017 |  |  |  |  |  |  |  |  |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Blanco et al., 2017 | Caud | Caud |  | Caud  Putam | Caud  Putam |  |  | ACC |  | Putam,  FG | Putam  ACC |  |  |  |  | FG |  |  |  |  |  |  |  |  |
| Camchong et al 2011 | ACC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Camchong et al 2013 | ACC |  |  |  |  |  | NAcc | NAcc |  | ACC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chen, C et al 2016 |  |  |  |  |  |  | NAcc | NAcc |  | Insula | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chen, J et al 2020 |  |  |  |  | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chen, X et al 2014\_NI | PCC | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chen, X et al 2014\_SI |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Contreras et al 2015 CD | Caud |  |  |  |  |  |  |  |  | Putam |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Contreras et al 2016CD | OFC | OFC |  |  |  |  | Amyg | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Contreras et al 2015 PG | Caud |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Contreras et al 2016PG | OFC |  |  |  |  |  | Amyg | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Denier et al 2015 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Thalam |  |
| Ding et al 2013 | PCC | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dong et al 2012 |  |  |  |  |  |  |  |  |  | IPL |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Farre et al 2021 AUD | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Farre et al 2021 AUD\_ADHD | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | FEF |  |  |  |  |  |  |  |
| Ge et al 2017 IGD |  |  |  | DLPFC | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ge et al 2017 SND |  |  |  |  | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Geng et al 2017 |  |  |  |  |  |  |  | TP |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gu et al 2010 |  | VTA  Hippo |  |  |  |  |  | ACC | NAcc | Amyg |  |  |  |  | PMA |  |  |  |  |  |  |  | Thalam |  |
| Halcomb et al 2019 |  |  |  |  |  |  |  |  |  | Insula | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Han et al 2019 |  | MCG |  |  | MFG  MCG |  |  |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Han et al 2018 |  |  |  | DLPFC | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Han,X te al 2018 | OFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hong et al 2015 |  |  |  |  |  |  |  |  |  |  | Putam |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Jung et al 2014 |  | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Kang et al 2018 |  |  |  |  |  |  |  | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Kelly et al 2011 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | IFS | IFS |  |  |  |  |  |  |  |
| Kim et al 2019 |  |  |  |  |  |  |  | OFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Kim et al 2021 | mPFC |  |  |  |  | DLPFC | ANcc  Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ko et al 2015 |  |  |  |  |  |  | Amyg | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Koehler et al 2013 |  |  |  | MFG | MFG |  | VS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Kohno et al 2018 |  |  |  |  | DLPFC |  | VS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Kohno et al 2014 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Thalam |  |  |
| Lee et al 2017 IGD | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lee et al 2017 IGD+ADHD | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lee et al 2018 IGD | ACC |  |  |  |  |  | ACC |  |  | ACC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lee et al 2018 IGD+DEP | ACC | ACC |  |  |  |  |  | ACC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lee et al 2021 |  |  |  |  |  |  |  |  |  |  | Putam |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lee et al (a) 2020 |  | PCC |  |  |  |  |  |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lee et al (b) 2021 |  |  |  |  |  |  |  |  |  |  |  |  | FEF | IPS |  |  |  |  |  |  |  |  |  |  |
| Li,Q et al 2013 | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Liao et al 2016 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Thalam |  |
| Lin et al 2018 |  |  |  |  | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lin et al 2015 |  | Caud |  |  | Caud  Putam |  |  | Caud |  | Putam | Putam  Caud |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Liu et al 2021 | AG | AG |  |  |  |  | NAcc | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Liu et al 2018 |  |  |  |  |  |  | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Liu et al 2019 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Thalam |  |
| Ma et al 2010 |  |  |  |  |  |  | NAcc  Amyg  OFC | NAcc  OFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| McHugh et al 2013 |  |  |  |  |  |  |  | Putam |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| McConnel et al 2020 |  |  |  |  |  |  | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Motzkin et al 2014 |  |  |  |  |  |  |  | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Muller et al 2015 | PCC  ACC | PCC |  | SFG | SFG |  |  | NAcc |  |  |  |  | postcentral |  |  | SPL |  |  |  |  |  |  |  |  |
| Pujol et al 2014 | PCC | PCC  Hippo |  | PCC | PCC |  |  |  |  | Insula | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pitel et al 2013 |  |  |  |  | cerebell |  |  |  |  |  |  |  |  |  |  |  | cerebell |  |  |  |  |  |  |  |
| Qiu et al 2013 |  |  |  |  | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Qiu et al 2016 | OFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Seok et al 2018 | Caud |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Shen et al 2017 |  |  |  |  |  |  | Amyg | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Shen et al 2018 |  |  |  |  |  |  |  |  |  |  | Cerebll |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sutherland et al 2013 |  |  |  |  |  |  |  |  |  |  | Insula ACC |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sun et al 2019 |  |  |  |  | SFG |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Um et al 2020 |  |  |  |  |  |  | Amyg |  | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Verdejo et al 2014 |  | ACC |  |  | ACC |  |  |  |  |  |  | Insula |  |  |  |  |  |  |  | Cuneus |  |  |  |  |
| Wang et al 2017 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Thalam |  |
| Wang et al 2018 |  |  |  |  | DLPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Cuneus |  |  | Thalam |  |
| Wang,J et al 2016 |  | mPFC |  |  |  |  |  | OFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wang,L et al 2016 | Precu | Precu |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Cuneus | cuneus |  |  |  |  |
| Wang,P et al 2016 |  |  |  |  |  |  |  |  |  | Insula | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wang et al 2019 |  |  |  |  |  |  | NAcc | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wang et al 2013 | Caud  ACC  SFG | Caud  ACC  SFG |  | Caud | Caud |  | Cerebll | Cerebll |  | STG | STG |  |  |  |  |  |  |  | SOG | SOG |  |  |  |  |
| Wang et al 2017 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Thalam |  |
| Xie et al 2011 |  |  |  |  |  |  | Amyg | Amyg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Yuan et al 2017 |  |  |  |  |  |  | Stria |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhai et al 2015 | mPFC | mPFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhai et al 2014 | Hippo | Hippo |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang,M et al 2018 |  |  |  |  |  |  | VS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang,M et al 2015 |  |  |  |  |  |  |  | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang,Y\_a et al 2016 |  |  |  |  |  |  |  |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang,Y\_b et al 2016 | PCC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang,H et al 2018 |  | MFG  SFG | Hippo  SFG |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang,S et al 2018 |  |  |  |  |  |  |  | VS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang et al 2015 |  |  |  | ACC | ACC |  |  |  |  | ACC | ACC |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhang et al 2016 |  |  |  |  |  |  |  |  |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zhou et al 2017 |  |  |  |  |  |  |  |  |  |  | Insula |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zimmermann et al 2018 | OFC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Zou et al 2015 |  |  |  |  |  |  | NAcc | NAcc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total | 37 | 33 | 3 | 11 | 24 | 1 | 27 | 27 | 2 | 17 | 19 | 2 | 2 | 1 | 1 | 3 | 3 | 0 | 2 | 4 | 0 | 1 | 7 | 0 |
|  | 57 | | | 27 | | | 41 | | | 29 | | | 4 | | | 5 | | | 4 | | | 8 | | |

Abbreviations: DMN: default mode network; FPN: frontoparietal network; AN: affective network; SN: salience network; DAN: dorsal attention network; SSN: sensorimotor network; ACC: anterior cingulate cortex; Amyg: Amygdala; AG: Angular gyrus; Caud: Caudata; DLPFC: dorsolateral prefrontal cortex; Hippo: Hippocampus; PMA: Primary motor cortex; OFC: orbitofrontal cortex; NAcc: nucleus accumbens; SFG: superior frontal gyrus; MFG: middle frontal gyrus; Thalam: Thalamus; Putam: Putamen; IPL: inferior parietal lobule; mPFC: medial prefrontal cortex; Precu: precuneus; VTA: ventral tegmental area; MFG: middle frontal gyrus; MCG: middle cingulate gyrus; cerebell: cerebellum; FG: fusiform gyri; IGD: internet gaming disorder; IbGD: internet-based gambling disorder; NI: internet gaming disorder without smoking; SI: internet gaming disorder with smoke; CD: cocaine dependence; PG: pathological gambling; AUD: alcohol use disorder; SND: smokers with nicotine dependence; FEF: Frontal Eye Field; TP: temporal pole; IFS: inferior frontal sulcus; SPL: superior parietal lobe; STG: Superior Temporal Gyrus; SOG: Superior Occiptal Gyrus; Stria: striatum; VS: ventral striatum; IPS: intraparietal sulcus; DEP: depression.

**Table S3** Demographic and clinical characteristics of SA included in the Meta-analysis

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Studies | Type | Sample | | Mean Age (addiction / HC) | Gender(male) | Co-morbidity | Drug usage | | | | Clinic scale |
| HC | Addiction | Age of onset use | Durations (year) | Substance use (gram/month) | Severity |
| Drug | | | | | | | | | | | |
| Adinoff et al 2015 | Cocaine | 20 | 22 | 44.7/42.2 | 86.4%/65.0% | 68%smokers  36.4%Alochol  31.8% Mix drug | NA | NA | AN | CCQ-Brief  OCCS | NA |
| Berlingeri et al, 2017 | Cocaine | 19 | 18 | 33.1/39.3 | 100%/68.4% | 44.4% alcohol  22.2%smoker | NA | NA | NA | NA | BIS, BDI, BAI, GAF |
| Blanco et al., 2012 | Cannabis | 29 | 28 | 21/22 | NA | 7% alcohol | 14.9 | 6.0 | NA | NA | NA |
| Camchong et al 2011 | Cocaine | 24 | 27 | 39.7/39.8 | 81.5%//79.2% | 29.6%depression | 25.56 | 14.6 | NA | NA | NA |
| Contreras et al 2015 CD | Cocaine | 21 | 20 | 34.6/31 | 95% | NA | 22.4 | NA | 18.4 | NA | NA |
| Contreras et al 2016 CD | Cocaine | 21 | 20 | 34.6/31 | 95% | NA | 22.4 | NA | 10.6 | NA | NA |
| Denier et al 2015 | Heroin | 20 | 29 | 41.5/40.3 | 72.4%/70% | 51.7% mix drug | 18.3 | 20.6 | 9.705 | NA | BIS-11 |
| Geng et al 2017 | Cocaine | 67 | 64 | 40.6/40.0 | 76.6%/68.7% | 75%smoke  10.9% mix drug  14.9% alcohol | NA | 13 | NA | NA | NA |
| Gu et al 2010 | Cocaine | 39 | 39 | 38/40 | 59.0%/74.4% | 79.5%smoke  51.3%THC  84.6% alcohol | NA | NA | NA | NA | WAIS |
| Kelly et al 2011 | Cocaine | 24 | 25 | 35.0/35.1 | 92%/83% | 24%smoke | 22 | 11.4 | NA | CSSA | CFQ |
| Kohno et al 2018 | Methamphetamine | 30 | 20 | 33.4/37.6 | 45%/86.7% | 52%smoker | NA | 12.0 | 31.8 | NA | NA |
| Kohno et al 2014 | Methamphetamine | 27 | 25 | 33.9/35.7 | 59%/48% | 80%smoker | NA | 8.59 | 14.9 | NA | NA |
| Li,Q et al 2013 | Heroin | 15 | 14 | 31.9/53.4 | NA | NA | NA | 7.44 | 18 | NA | NA |
| Liao et al 2016 | Ketamine | 88 | 40 | 27.1/26.8 | 79.5%/82% | 100%Smoker  30.4%alcohol  63% mix drug | 23.1 | 3.425 | 41.07 | NA | NA |
| Lin et al 2018 | Heroin | 30 | 30 | 30.1/29.8 | 100%/100% | NA | NA | NA | NA | NA | NA |
| Ma et al 2010 | Heroin | 13 | 14 | 29.8/30.1 | 100%/100% | 100%smoker | NA | 7.11 | NA | NA | NA |
| McHugh et al 2013 | Opioid | 22 | 45 | 43.5/42.05 | 86.7%/63.6% | 77.8%smoker  22.2%mix drug | 26.8 | 8.34 | NA | NA | BIS-11 |
| McConnel et al 2020 | Cocaine | 30 | 31 | 36.9/51.5 | 47%/55% | 35% drug mix | NA | NA | NA | NA | NA |
| Motzkin et al 2014 | Substance | 18 | 22 | 31.7/32.0 | NA | 50%smoker  100% mix drug | 18.7 | 3.2 | NA | NA | NA |
| Pujol et al 2014 | Cannabis | 29 | 28 | 22/21 | NA | 6.9%smoke | <16 | >2 | NA | NA | STAI |
| Qiu et al 2013 | Heroin | 30 | 30 | 41.5/42.4 | 100%/100% | NA | NA | 7.66 | 1.56 | NA | NA |
| Qiu et al 2016 | Codeine | 14 | 14 | 24.1/24.9 | NA | NA | 19.79 | 4.96 | NA | NA | NA |
| Verdejo et al 2014 | Cocaine | 14 | 10 | 30.1/35.1 | 92.8%/80% | NA | NA | NA | NA | NA | NA |
| Wang,L et al 2016 | Heroin | 30 | 30 | 38.9/40.7 | 76.6%/80% | NA | NA | 14.4 | NA | NA | BIS-11 |
| Wang,P et al 2016 | Heroin | 30 | 30 | 42.44/41.47 | 100%/100% | NA | NA | 7.66 | 1.56 | NA | NA |
| Wang et al 2019 | Amphetamine | 21 | 16 | 29.52/28 | 100%/100% | 52% mix drug | NA | NA | NA | NA | NA |
| Wang et al 2013 | Heroin | 17 | 15 | 33.9/34.3 | 100%/100% | 100%smoker | NA | 6.79 | 2.13 | NA | NA |
| Xie et al 2011 | Heroin | 22 | 15 | 33.05/28.91 | 100%/100% | NA | NA | 6.59 | 28.8 | NA | NA |
| Zhai et al 2015 | Heroin | 22 | 15 | 33.05/28.87 | 100%/100% | NA | NA | 6.59 | 28.8 | NA | NA |
| Zhai et al 2014 | Heroin | 22 | 15 | 33.05/28.87 | 100%/100% | NA | NA | 6.59 | 28.8 | NA | NA |
| Zhang et al 2018 | Methamphetamine | 18 | 17 | 23.8/21 | 43.7%/52.9% | 31.25%alcohol  31.25%smoker | NA | NA | NA | NA | NA |
| Zhang\_SL et al 2018 | Cocaine | 66 | 66 | 39.3/41.4 | 54.5%/66.7% | NA | 17.1 | 20.2 | 31.4 | NA | NA |
| Zhang et al 2015 | Heroin | 15 | 21 | 27.79/33.07 | 100%/100% | NA | NA | 6.02 | 25.5 | NA | NA |
| Zimmermann et al 2018 | Marijuana | 18 | 19 | 24.11/23.79 | 10.5%/11.1% | 94.7%smoke  94.4%smoke  100%mix drug | NA | NA | NA | NA | NA |
| Zou et al 2015 | Heroin | 29 | 30 | 40.73/38.9 | 80%/66.7% | 86.67%smoke | NA | NA | NA | NA | NA |
| Alcohol | | | | | | | | | | | |
| Camchong et al 2013 | Alcohol | 23 | 23 | 48.5/48.0 | 65.2% | 43.5% MDD  17.39%drug  30.43% smoke | NA | NA | 188.51 | NA | NA |
| Farre et al 2021 AUD | Alcohol | 18 | 17 | 48.29/40.7 | 88.2%/66.7% | 52.9%smokers | NA | NA | NA | AUDIT  AUQ, ADS | FTND |
| Farre et al 2021 AUD+ADHD | Alcohol | 18 | 10 | 41.10/40.7 | 70%/66.7% | 80%smokers  ADHD | NA | NA | NA | AUDIT, AUQ, ADS | FTND |
| Halcomb et al 2019 | Alcohol | 16 | 21 | 35.3/37.3 | 47.6%/68.8% | 19%smoke | NA | NA | 34.8 | NA | NA |
| Liu et al 2019 | Alcohol | 15 | 15 | 47.3/47.3 | 100% | NA | NA | NA | 63.2 | ADS,  AUDIT | BIS-11, SAS, SDS |
| Muller et al 2015 | Alcohol | 26 | 27 | 49/50 | 65%/66.7% | NA | 29 | NA | NA | AUDIT | BIS-11, BDI, STAI-T, STAI-S |
| Pitel et al 2013 | Alcohol | 12 | 12 | 38/43 | 100% | NA | NA | NA | NA | NA | NA |
| Wang et al 2018 | Alcohol | 33 | 56 | 43.4/42.9 | 100% | 91.1% smoke | 19.7 | NA | 49.1 | MAST | BIS-11, HAMD, HAMA |
| Wang,J et al 2016 | Alcohol | 20 | 20 | 40.5/43.95 | 100% | 82.5%Smoker | 18.7 | NA | 61.4 | MAST | BIS-11 |
| Smoke | | | | | | | | | | | |
| Bai et a 2017 | Smoke | 24 | 24 | 20.8/20.6 | 100% | NA | NA | 4.7 | 498 | FTND | NA |
| Bi et al 2017 | Smoke | 40 | 40 | 19.62/19.8 | NA | NA | 13.73 | 4.2 | 467.4 | FTND | NA |
| Ge et al 2017 SND | Smoke | 33 | 29 | 22.6/20.8 | 100%81.8% | NA | NA | 2-10 | NA | FTND | BIS-11, SAS, SDS |
| Shen et al 2017 | Smoke | 41 | 84 | 38.46/38.32 | 100% | NA | NA | 17.35 | 706.8 | FTND | HRSD, HRSA |
| Shen et al 2018 | Smoke | 14 | 85 | 38.46/28.24 | 100% | NA | 20.87 | 17.36 | 703.8 | FTND | NA |
| Zhou et al 2017 | Smoke | 37 | 37 | 32.81/33.11 | 100% | NA | 17.92 | 15.05 | 672.9 | FTND | NA |
| Wang et al 2017 | Smoke | 24 | 24 | 20.6/20.8 | 100% | NA | 14.2 | 4.7 | 498 | FTND | NA |
| Chen et al 2014 | Smoke | 30 | 29 | 22.1/20.8 | 100% | 100%IGD | NA | NA | NA | FTND | SAS, SDS, BIS-11 |
| Sutherland et al 2013 | Smoke | 20 | 24 | 36/30 | 50%/50% | NA | NA | 18 | 540 | NA | NA |
| Um et al 2020 | Smoke | 34 | 62 | 34.15/35.31 | 41.17%/40.32% | 32% alcohol use | 15.13 | 16 | 270 | FTND | NA |

Abbreviations: ADS: Alcohol Dependence Scale; AUDIT: Alcohol Use Disorder Identification Test; AUQ: Alcohol Urge Questionnaire; BAI :Beck Anxiety Inventory; BDI: Beck Depression Inventory; BIS-11: Barratt Impulsiveness Scale -11; GAF: Global Assessment of Functioning; FTND: Fagerstrom Test for Nicotine Dependence; CCQ-Brief: Cocaine Craving Questionnaire-Brief; CSSA: Cocaine Selective Severity Assessment; CFQ: Cognitive Failures Questionnaire; HAMA: Hamilton Anxiety Scale; HAMD: Hamilton Depressive Scale; HRSD: Hamilton Rating Scale for Depression; HRSA: Hamilton Rating Scale for Anxiety; MAST: Michigan Alcoholism Screening Test; OCCS: Obsessive-Compulsive Cocaine Scale; SAS: Self-Rating Anxiety Scale; SDS: Self-Rating Depression Scale; STAI: State Trait Anxiety Inventory; STAI-T: Trait Anxiety Inventory; STAI-S: State Anxiety Inventory;

**Table S4** Demographic and clinical characteristics of BA included in the Meta-analysis

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Studies | Sample | | Mean Age (addiction / HC) | Gender(male) | Co-morbidity | Clinic Measurement | | | | Severity |
| HC | Addiction | Anxiety | Depression | Impulsivity | Other |
| IGD | | | | | | | | | | |
| Bae et al., 2017 | 15 | 15 | 25.7/25.7 | 100% | 66.7%alcoho  53.3%Smoke | NA | BDI | BIS-11 | K-ARS | YIAS |
| Chen, C et al 2016 | 28 | 28 | 23.6/24.1 | 100% | NA | NA | NA | BIS-11 | NA | CIAS |
| Chen, J et al 2020 | 26 | 22 | 14.1/ 13.9 | 77.2%/73.1% | NA | NA | NA | BIS-11 | NA | IAT |
| Chen, X et al 2014 SI | 30 | 29 | 22.1/20.8 | 100% | 100%smoke | SAS | SDS | BIS-11 | FTND | CIAS |
| Chen, X et al 2014 NI | 30 | 22 | 21/20.8 | 100% | Na | SAS | SDS | BIS-11 | NA | CIAS |
| Ding et al 2013 | 24 | 17 | 16.9/15.9 | 76.5%/66.6% | NA | SAS | SDS | BIS | NA | CIAS |
| Dong et al 2012 | 14 | 15 | 24.2/24.6 | 100% | NA | NA | NA | NA | NA | IAT |
| Ge et al 2017 IGD | 33 | 27 | 20.78/20.8 | 70.4%/81.8% | NA | SAS | SDS | BIS-11 | NA | CIAS |
| Han et al 2019 | 38 | 49 | 14.6/14.8 | NA | 59.2%ADHD | BAI | CDI | BIS | NA | YIAS |
| Han,Wu et al 2018 | 30 | 30 | 21.2/20.83 | 40%/43.3% | NA | SAS | SDS | BIS-11 | NA | CIAS |
| Han,X te al 2018 | 30 | 26 | 16.81/17.0 | 100% | NA | SAS | SDS | BIS-11 | NA | CIAS |
| Hong et al 2015 | 11 | 12 | 13.41/14.8 | 100% | NA | NA | NA | NA | NA | YIAS |
| Kang et al 2018 | 15 | 15 | 15.6/15.7 | 100% | NA | NA | CDI | NA | K-ARS | YIAS |
| Kim et al 2019 | 24 | 22 | 28.27/28.17 | 100% | NA | NA | NA | DII | NA | IGD scale |
| Kim et al 2021 | 23 | 22 | 24.30/23.5 | 100% | NA | HADS | HADS | BIS-11 | NA | IAT |
| Ko et al 2015 | 30 | 30 | 23.57/24.3 | 100% | NA | NA | NA | BIS-11 | NA | CIAS |
| Lee et al 2017 IGD | 19 | 24 | 24.3/23.6 | 100% | NA | BAI | BDI | BIS-11 | WURS  AUDIT | IAT |
| Lee et al 2017 IGD+ADHD | 19 | 20 | 23.6/23.6 | 100% | 100%ADHD | BAI | BDI | BIS-11 | WURS  AUDIT | IAT |
| Lee et al 2018 IGD | 20 | 22 | 24.0/24.0 | 100% | NA | BAI | BDI | BIS-11 | AUDIT | IAT |
| Lee et al 2018 IGD+DEP | 20 | 22 | 24.0/24.0 | 100% | 100%Depression | BAI | BDI | BIS-11 | AUDIT | IAT |
| Lee et al 2021 | 18 | 18 | 23.8/23.9 | 100% | NA | BAI | BDI | BIS-11 | AUDIT | IAT |
| Lee et al 2020 | 18 | 17 | 13.7/13.4 | 100% | NA | BAI | BDI | BIS-11 | CASS | KS |
| Lin et al 2015 | 15 | 14 | 17.1/17.9 | 100% | NA | SCARED | NA | BIS-11 | NA | YIAS |
| Liu et al 2021 | 41 | 74 | 22.3/23.0 | 100% | NA | BAI | BDI | NA | NA | CIAS |
| Liu et al 2018 | 41 | 74 | 22.3/23.0 | 100% | 77.0% alcohol  10.8%smoke | BAI | BDI | NA | NA | CIAS |
| Seok et al 2018 | 20 | 20 | 21.7/22.4 | 100% | NA | NA | BDI | BIS-11 | AUDIT | IAT |
| Sun et al 2019 | 52 | 53 | 21.9/20.9 | 56.6%/57.7% | NA | NA |  | BIS-11 |  | CIAS |
| Yuan et al 2017 | 44 | 43 | 19.0/19.5 | 74.4%/77.3% | NA | NA | BDI |  |  | IAT |
| Zhang,M et al 2018 | 41 | 74 | 22.3/23.0 | 100% | 77.0% alcohol  10.8%smoke | BAI | BDI | BIS-11 | Craving | CIAS |
| Zhang,M et al 2015 | 24 | 35 | 22.5/23.1 | NA | 80.0% alcohol  14.3%smoke | BAI | BDI | NA | Craving | CIAS |
| Zhang,Y b et al 2016 | 41 | 74 | 22.3/23.0 | 100% | 77.0% alcohol  10.8%smoke | BAI | BDI | NA | FTND | CIAS |
| Zhang,JT et al 2016 | 19 | 36 | 22.1/22.9 | 100% | NA | BAI | BDI | NA | FTND  Craving  AUDIT | CIAS |
| Zhang, Y a et al 2016 | 19 | 19 | 20.8/21.5 | 89.5% | NA | NA | NA | NA |  | YIAS |
| Lee et al 2021 | 49 | 39 | 22.9/22.4 | 74.4%/65.3% | NA | BAI | BDI | BIS | AUDIT | IAT, SAPS |
| Gambling | | | | | | | | | | |
| Contreras et al 2015 PG | 21 | 19 | 33.8/31 | 89.5%/95% | NA | NA | NA | NA | NA | NA |
| Contreras 2016 PG | 21 | 19 | 33.8/31 | 89.5%/95% | NA | NA | NA | NA | NA | NA |
| Jung et al 2014 | 15 | 15 | 27.9/26.6 | 100% | NA | BAI | BDI | NA | NA | PG-YBOCS, SOGS |
| Koehler et al 2013 | 19 | 19 | 32.79/37 | 100% | NA | NA | NA | BIS-10 | NA | KFG, G-SAS |
| Bae et al 2017 | 15 | 14 | 26.0/25.7 | 100% | 64.3%smoke  78.6%alcohol | NA | NA | NA | NA | NA |

Abbreviations: AUDIT: Alcohol Use Disorder Identification Test; BDI: Beck Depression Inventory; BIS-11: Barratt Impulsiveness Scale -11; CASS: Conners/Wells Adolescent Self-report Scale; CDI: Child Depression Inventory; CIAS: Chen Internet Addiction Scale; DII: Dickman Impulsivity Inventory; FTND: Fagerstrom Test for Nicotine Dependence; G-SAS: Gambling Symptom Assessment Scale; HADS: Hospital Anxiety and Depression Scale; IAT: Internet Addiction Test; IGD scale: Self-reported Internet Gaming Disorder Scale; K-ARS: Korean ADHD Rating Scale; KFG, “Kurzfragebogen zum Glücksspielverhalten” (gambling questionnaire); KS: Korean Internet Addiction Proneness Scale, SAS: Self-Rating Anxiety Scale; PG-YBOCS, Pathological Gambling Modification of Yale-Brown Obsessive Com pulsive Scale; SAPS, Smartphone Addiction Proneness Scale; SCARED: The Screen for Child Anxiety Related Emotional Disorders; SDS: Self-Rating Depression Scale; SOGS, South Oaks Gambling Screen; WURS: WURS: Wender Utah Rating Scale; YIAS: Young Internet Addiction Scale.

**Table S5** Summary of Methods Implemented in Studies Included in Meta-analysis

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TAL** | **Scanner** | **Duration (min)** | **TR/TE (ms)** | **EO/C** | **seed type** | **Software** | **Preprocessing**  **Nuisance Regressors** | **Coordinate**  **System** | **Motion Inclusion Criteria** |
| Adinoff et al 2015 | Philips 3T | 6 | 1700/2 | O | Mask | SPM8 | 6MP, WM, CSF | TAL | AFN |
| Bae et al., 2017 | Philips 3T | 12 | 3000/40 |  | NA | SPM8, REST | NA | TAL | 2mm or 2° |
| Bai et a 2017l | Discovery 3T | 6.16 | 8.5/3.4 | C | Mask | DPARSF, SPM12, | 6MP, CSF | MNI | Wavelet despiking |
| Berlingeri et al, 2017 | GE 1.5T | 10 | 3000/60 | C | 5mm sphere | DPARSF, MRIcorn | 6MP, CSF, WM, GS | MNI | NA |
| Blanco et al., 2017 | GE 1.5T | 6 | 2000/50 | C | 3.5mm sphere | SPM8 | NA | MNI | NA |
| Camchong et al 2011 | Siemens 3T | 6 | 2000/30 | C | 3.5mm sphere | FEAT, | NA | MNI | NA |
| Camchong et al 2013 | Siemens 3T | 4.06 | 2000/30 | C | 3.5mm sphere | AFNI, FMRIB | CSF, WM | MNI | NA |
| Chen, C et al 2016 | GE 3T | 10 | 6.6/2.8-12 | C | 3.5mm sphere | SPM8 | 6MP, CSF, WM, GS | MNI | NA |
| Chen, J et al 2020 | Siemens 3T | 3 | 1650/27 | C | 6mm sphere | SPM12, DPABI, REST | NA | MNI | NA |
| Chen, X et al 2014 | GE 3T | 7.3 | 2000/30 | C | NA | DPARSF, SPM8, REST | 6MP, CSF, WM | MNI | 1mm or 1° |
| Contreras et al 2015 | Philips 3T | 6 | 2000/35 | C | 3.5mm sphere | SPM8 | CSF, WM | MNI | NA |
| Denier et al 2015 | Siemens 3T | 5 | 2000/28 | NA | Mask | SPM8, CONN toolbox, REST | CSF, WM | MNI | NA |
| Ding et al 2013 | GE 3T | 7.3 | 2000/30 | C | Mask | MRIcorn, REST, SPM5, Data Processing Assistant for  Resting-State fMRI V 2.0 | 6MP, CSF, WM, GS | MNI | 1mm or 1° |
| Dong et al 2012 | Siemens 3T | NA | 2000/30 | C | Mask | DPARSF | NA | MNI | 2mm or 1° |
| Farre et al 2021 | Siemens 3T | 6.06 | 1500/28 | C | NA | CONN | CSF, WM, gray matter | MNI | 3mm or 3° |
| Ge et al 2017 | GE 3T | 7.3 | 2000/30 | C | Mask | DPABI, SPM8 | 6MP, CSF, WM, GS | MNI | 1.5mm or 1.5° |
| Geng et al 2017 | Siemens 3T | 6 | 2000/27 | C | Mask | AFNI | 6MP, CSF, WM | TAL | NA |
| Gu et al 2010 | Siemens 3T | 6 | 2000/27 | C | Mask | AFNI，SPM5 | 6MP, CSF, WM | TAL | NA |
| Halcomb et al 2019 | Siemens 3T | NA | 1200/29 | C | Mask | FSL version，SPM12 | CSF, WM, gray matter | MNI | NA |
| Han et al 2019 | Philips 3T | 12 | 3000/40 | NA | NA | DPARSF, SPM12, REST, CONN-fMRI FC | CSF, WM, gray matter | MNI | 3mm or 2° |
| Han et al 2018 | GE 3T | 7.3 | 2000/30 | C | Mask | SPM12, DPABI | 24MP, CSF, WM | MNI | 1.5mm or 1.5° |
| Han,X te al 2018 | GE 3T | 7.3 | 2000/30 | C | Mask | SPM12, DPABI | 6MP, CSF, WM, GS | MNI | 1mm or 1° |
| Hong et al 2015 | Siemens 3T | 6.75 | 2700/30 | C | Mask | SPM8 | CSF, WM, GS | MNI | 2mm or 2° |
| Jung et al 2014 | Siemens 1.5T | 4.68 | 2340/52 | C | Mask | FMRIB, ANFI | NA | MNI | NA |
| Kang et al 2018 | Siemens 3T | NA | 3000/30 | C | Mask | REST | CSF, WM | TAL | 3mm or 3° |
| Kelly et al 2011 | Siemens 3T | 6 | 2000 | C/O | Mask | ANFI, FSL | MP, CSF, WM, GS | MNI | NA |
| Kim et al 2019 | Siemens 3T | NA | 2000/30 | O | NA | SPM8, DPARSF | NA | MNI | NA |
| Kim et al 2021 | Siemens 3T | 6 | 2000/30 | O | NA | CONN | CSF, WM, gray matter | MNI | 3mm |
| Ko et al 2015 | Siemens 3T | NA | 2000/35 | C | Mask | DARTEL, SPM8, REST | CSF, WM, gray matter | MNI | 2mm or 2° |
| Koehler et al 2013 | Siemens 3T | NA | 2500/35 | NA | NA | FMRIB, AFNI | CSF, WM | MNI | NA |
| Kohno et al 2018 | Siemens 3T | NA | 2000/40 | O | NA | FSL, | CSF, WM, two metrics of motion-related artifac | MNI | NA |
| Kohno et al 2014 | Siemens 3T | 5 | 2000/30 | O | 10mm sphere | FSL, FMRIB | CSF, GS, 2 metrics of motion-related artifact | MNI | 2mm or 1.5° |
| Lee et al 2017 | Siemens 3T | 6 | 2200/30 | O | 6mm sphere | SPM8, CONN-fMRI | NA | MNI | 3mm |
| Lee et al 2018 | Siemens 3T | 6 | 2200/30 | O | 5mm sphere | SPM8, CONN-fMRI | NA | MNI | 2mm |
| Lee et al 2021 |  |  |  |  | 4mm sphere | SPM12 | CSF, WM, gray matter | MNI | 3mm |
| Lee et al 2020 | Siemens 3T | 15 | 2200/30 | O | 5mm sphere | SPM12 ，CONN-fMRI | CSF, WM, gray matter | MNI | 3mm |
| Li,Q et al 2013 | GE 3T | NA | 2000/30 | NA | 6mm sphere | SPM5 | CSF, WM, GS | TAL | 1.5mm or 1.5° |
| Liao et al 2016 | Siemens 3T | 9 | 3000/30 | C | 6mm sphere | SPM8, AFNI | NA | MNI | NA |
| Lin et al 2018 | GE 3T | NA | 2000/35 | C | Mask | SPM8 | CSF, WM, gray matter | MNI | 3mm |
| Lin et al 2015 | Philips 3T | NA | 2000/30 | C | 6mm sphere | SPM8 | CSF, WM, GS | MNI | 2mm or 2° |
| Liu et al 2021 | Siemens 3T | NA | 2000/30 | NA | Mask | DPABI, SPM8 | CSF, WM, gray matter | MNI | 3mm or 3° |
| Liu et al 2018 | Siemens 3T |  | 2000/30 | O | Mask | DPABI, SPM8 | NA | MNI | 3mm or 3° |
| Liu et al 2019 | Philips 3T | NA | 2000/30 | NA | NA | Freesurfer，ANFI,FSL | NA | MNI | NA |
| Ma et al 2010 | Siemens 3T | 6 | 2000/30 | O | Mask | FSL，AFNI | CSF, WM, | TAL | 1mm |
| McHugh et al 2013 | Philips 3T | NA | 1700/25 | NA | NA | AFNI, Freesurfer | CSF, WM, | TAL | NA |
| McConnel et al 2020 | Philips 3T | 6 | 2000 | C | Mask | CAT12, SPM12, CONN | NA | MNI | NA |
| Motzkin et al 2014 | Siemens 1.5T | 5.5 | 2000/39 | NA | NA | AFNI, FSL | 6MP, WA, ventricular time series | MNI | NA |
| Muller et al 2015 | 3T GE | NA | 2200/30 | NA | Mask | SPM8, CONN | NA | MNI | NA |
| Pujol et al 2014 | 1.5T GE | 4 | 2000/50 | O | 3.5 mm sphere | SPM8 | NA | MNI | NA |
| Pitel et al 2013 | 3T GE | 5 | 2200/30 | C | NA | SPM8 | CSF, WM, GM | MNI | NA |
| Qiu et al 2013 | 3T GE | NA | 2000/35 | C | Mask | SPM8, REST | 6MP, CSF, WM | MNI | 3mm |
| Qiu et al 2016 | 1.5T Philips | NA | 2000/50 | C | NA | SPM8, REST | CSF, WM, gray matter | TAL | 1mm |
| Seok et al 2018 | 3T Philips | NA | 2000/28 | O | Mask | SPM8, VBM8, CONN | CSF, WM, | MNI | NA |
| Shen et al 2017 | 3T GE | 6.16 | 2000/30 | C | Mask | Freesurfer, DPARSFA, REST | 24MP, CSF, WM | MNI | 2mm |
| Shen et al 2018 | 3T GE | 6.16 | 2000/30 | C | 3 mm sphere | SUIT, SPM8 | 6MP, CSF, WM | MNI | 2mm |
| Sun et al 2019 | 3T GE | 7.3 | 2000/30 | C | Mask | SPM8, REST, DPABI, AFNI | 6MP, CSF, WM | MNI | 1.5mm or 1.5° |
| Verdejo et al 2014 | 1.5T GE | NA | 2000/50 | NA | Mask | SPM8 | CSF, WM, GS | MNI | NA |
| Wang et al 2017 | 3T GE | 6.16 | 8.5/3.4 | NA | NA | DPARSF, SPM12 | 6MP, CSF, WM | MNI | NA |
| Wang et al 2018 | Siemens 3T | NA | 2000/30 | C | 6 sphere | SPM8, REST | 6MP, CSF, WM, GS | MNI | 2mm or 2° |
| Wang,J et al 2016 | Siemens 3T | NA | 2000/30 | C | 10 mm sphere | SPM8 | 6MP, CSF, WM, GS | MNI | 2mm or 2° |
| Wang,L et al 2016 | Siemens 3T | 8 | 2000/30 | C | NA | SPM8, DARTEL | 6MP, CSF, WM, GS | MNI | 1mm or 1° |
| Wang,P et al 2016 | GE 3T | 8 | 2000/35 | C | Mask | SPM8, REST | CSF, WM, GS | MNI | NA |
| Wang et al 2019 | GE 1.5T | NA | 3000/40 | NA | NA | DPARSF, SPM12, REST | 6MP, CSF, WM | MNI | 3mm or 3° |
| Wang et al 2013 | GE 3T | 5.16 | 2000/30 | C | 6 sphere | SPM8 | NA | TAL | 1mm or 1° |
| Xie et al 2011 | GE 3T | 6 | 2000/25 | C | Mask | ANFI, SPM8, mathworks | 6MP, CSF, WM | TAL | NA |
| Yuan et al 2017 | GE 3T | 6.16 | 2000/30 | C | NA | Freesurfer, ANFI, FSL | NA | MNI | NA |
| Zhai et al 2015 | GE 3T | 6 | 2000/25 | C | 6 spher | SPM8, AFNI | 6MP, CSF, WM, GS | MNI | NA |
| Zhai et al 2014 | GE 3T | 6 | 2000/25 | C | Mask | SPM8, AFNI | 6MP, CSF, WM, GS | MNI | NA |
| Zhang,J et al 2018 | Siemens 3T | NA | 2000/30 | O | NA | DPARSF | 24MP, CSF, WM | MNI | 3mm or 3° |
| Zhang,J et al 2015 | Siemens 3T | NA | 2000/30 | O | NA | DPARSF, REST | 6MP, CSF, WM, GS | MNI | 3mm or 3° |
| Zhang,J et al 2016 | Siemens 3T | NA | 2000/30 | O | 6 sphere | DPARSF, REST, SPM8 | CSF, WM | MNI | 3mm or 3° |
| Zhang,JT et al 2016 | Siemens 3T | NA | 2000/30 | O | 6 sphere | DPARSF, SPM8 | CSF, WM | MNI | 3mm or 3° |
| Zhang et al 2018 | GE 3T | 6 | 2000/30 | C | 6 mm sphere | SPM8, DPARSF | 6MP, CSF, WM, GS | MNI | 3mm or 3° |
| Zhang et al 2018 | Siemens 3T | 10 | 2000/25 | C | Mask | SPM8 | 6MP, CSF, WM, GS | MNI | 1mm |
| Zhang et al 2015 | GE 3T | NA | 2000/25 | NA | mask | SPM8, AFNI | 6MP, CSF, WM, GS | TAL | NA |
| Zhang et al 2016 | Siemens 3T | NA | 2000/35 | C | Mask | SPM8, DPARSF, REST | 6MP, CSF, WM, GS | MNI | 3mm or 3° |
| Zhou et al 2017 | Siemens 3T | NA | 3000/30 | C | NA | SPM12, DPARSF | 6MP, CSF, WM, | MNI | 3mm or 3° |
| Zimmermann et al 2018 | Siemens 3T | NA | 2500/30 | C | 10 mm sphere | SPM8, FSL | CSF, WM, | MNI | 3mm or 3° |
| Zou et al 2015 | Siemens 3T | 8 | 2000/30 | C | Mask | SPM8 | CSF, WM, GM | MNI | 1 mm |
| Sutherland et al 2013 | Siemens 3T | 8 | 2000/27 | C | NA | AFNI, SPM5 | CSF, WM, GM | MNI | NA |
| Um et al 2020 | Siemens 3T | 5 | 2500/30 | NA | NA | AFNI, SPM5 | CSF, WM, GM | MNI | NA |
| Contreras et al 2016 | Philips 3T | 6 | 2000/35 | C | 3.5mm sphere | SPM8 | CSF, WM | MNI | NA |

Abbreviations: TR=repetition time; TE=echo time; MP= motion parameters; CSF=cerebrospinal fluid; WM= white matter; GS= global signal; RMS=root mean square; FD=framewise displacement; SPM=Statistical Parametric Mapping; AFNI=Analysis of Functional NeuroImages; CONN=Functional Connectivity Toolbox; DPARFS=Data Processing Assistant for Resting-State fMRI; DPABI: Data Processing & Analysis for Brain Imaging; fMRISTAT=a MATLAB toolbox for the statistical analysis of fMRI data; FSL=FMRIB Software Library; GIFT: Group ICA of fMRI Toolbox; REST=Resting-State fMRI Data Analysis Toolkit.

**Table S6** Results of Jackknife Sensitivity Analysis of Addiction-HC

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Discarded datasets** | Seed Networks and effect anatomy | | | | | | | | | |
| DMN | | | | FPN | | AN | | SN | |
| Right IFG | Right LN | Left FAT | Left ATP | Left insula | Left ATP | Left IFG | Right IFG | Left RO | Right MCC |
| Adinoff et al 2015 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Bae et al., 2017 IGD | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |
| Bae et al., 2017 ibGD | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |
| Berlingeri et al, 2017 |  |  |  |  |  |  | Yes | Yes |  |  |
| Blanco et al., 2017 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Camchong et al 2011 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Camchong et al 2013 | Yes | Yes | Yes | No |  |  | Yes | Yes | Yes | Yes |
| Chen, C et al 2016 |  |  |  |  |  |  | Yes | Yes | No | Yes |
| Chen, J et al 2020 |  |  |  |  | Yes | Yes |  |  |  |  |
| Chen, X et al 2014\_NI | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Chen, X et al 2014\_SI | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Contreras et al 2015 CD | Yes | Yes | Yes | Yes |  |  |  |  | Yes | Yes |
| Contreras et al 2015 PG | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Denier et al 2015 |  |  |  |  |  |  |  |  |  |  |
| Ding et al 2013 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Dong et al 2012 |  |  |  |  |  |  |  |  | Yes | Yes |
| Farre et al 2021 AUD | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Farre et al 2021 AUD+ADHD | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Ge et al 2017 IGD |  |  |  |  | Yes | Yes |  |  |  |  |
| Ge et al 2017 SND |  |  |  |  | Yes | Yes |  |  |  |  |
| Geng et al 2017 |  |  |  |  |  |  | Yes | Yes | Yes | Yes |
| Gu et al 2010 | Yes | Yes | Yes | Yes |  |  | Yes | Yes | Yes | Yes |
| Halcomb et al 2019 |  |  |  |  |  |  |  |  | Yes | Yes |
| Han et al 2019 | Yes | Yes | Yes | Yes | Yes | Yes |  |  | Yes | Yes |
| Han et al 2018 |  |  |  |  | Yes | Yes |  |  |  |  |
| Han,X te al 2018 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Hong et al 2015 |  |  |  |  |  |  |  |  | Yes | Yes |
| Jung et al 2014 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Kang et al 2018 |  |  |  |  |  |  | Yes | Yes |  |  |
| Kelly et al 2011 |  |  |  |  |  |  |  |  |  |  |
| Kim et al 2019 |  |  |  |  |  |  | Yes | Yes |  |  |
| Kim et al 2021 | Yes | Yes | Yes | Yes |  |  | Yes | Yes |  |  |
| Ko et al 2015 |  |  |  |  |  |  | Yes | Yes |  |  |
| Koehler et al 2013 |  |  |  |  | Yes | Yes | Yes | Yes |  |  |
| Kohno et al 2018 |  |  |  |  | Yes | Yes | Yes | Yes |  |  |
| Kohno et al 2014 |  |  |  |  |  |  |  |  |  |  |
| Lee et al 2017 IGD | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Lee et al 2017 IGD+ADHD | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Lee et al 2018 IGD | Yes | Yes | No | Yes |  |  | Yes | Yes | Yes | Yes |
| Lee et al 2018 IGD+DEP | Yes | Yes | No | Yes |  |  | Yes | Yes |  |  |
| Lee et al 2021 |  |  |  |  |  |  |  |  | Yes | Yes |
| Lee et al 2020 | Yes | Yes | Yes | Yes |  |  |  |  | Yes | Yes |
| Li,Q et al 2013 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Lin et al 2018 |  |  |  |  | Yes | Yes |  |  |  |  |
| Lin et al 2015 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Liu et al 2021 |  |  |  |  |  |  | Yes | No |  |  |
| Liu et al 2018 |  |  |  |  |  |  | Yes | No |  |  |
| Ma et al 2010 |  |  |  |  |  |  | Yes | Yes |  |  |
| McHugh et al 2013 |  |  |  |  |  |  |  |  |  |  |
| McConnel et al 2020 |  |  |  |  |  |  | Yes | Yes |  |  |
| Motzkin et al 2014 |  |  |  |  |  |  | Yes | Yes |  |  |
| Muller et al 2015 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |
| Oliva et al 2020 |  |  |  |  | Yes | Yes |  |  |  |  |
| Pujol et al 2014 | Yes | Yes | Yes | Yes | Yes | Yes |  |  | Yes | Yes |
| Pitel et al 2013 |  |  |  |  | Yes | Yes |  |  |  |  |
| Qiu et al 2013 |  |  |  |  | Yes | Yes |  |  |  |  |
| Qiu et al 2016 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Seok et al 2018 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Shen et al 2017 |  |  |  |  |  |  | Yes | Yes |  |  |
| Shen et al 2018 |  |  |  |  |  |  |  |  | Yes | Yes |
| Sousa et al 2019 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Sun et al 2019 |  |  |  |  | Yes | Yes |  |  |  |  |
| Verdejo et al 2014 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| Wang et al 2018 |  |  |  |  | Yes | No |  |  |  |  |
| Wang,J et al 2016 | Yes | Yes | Yes | Yes |  |  | Yes | Yes |  |  |
| Wang,L et al 2016 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Wang,P et al 2016 |  |  |  |  |  |  |  |  | Yes | Yes |
| Wang et al 2019 |  |  |  |  |  |  | Yes | Yes |  |  |
| Wang et al 2013 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Xie et al 2011 |  |  |  |  |  |  | Yes | Yes |  |  |
| Yuan et al 2017 |  |  |  |  |  |  | Yes | Yes |  |  |
| Zhai et al 2015 | Yes | No | Yes | Yes |  |  |  |  |  |  |
| Zhai et al 2014 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Zhang,M et al 2018 |  |  |  |  |  |  | No | Yes |  |  |
| Zhang,M et al 2015 |  |  |  |  |  |  | Yes | Yes |  |  |
| Zhang,Y\_a et al 2016 | Yes | Yes | Yes | Yes | Yes | Yes |  |  | No | Yes |
| Zhang,Y\_b et al 2016 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Zhang,H et al 2018 | Yes | Yes | No | Yes |  |  |  |  |  |  |
| Zhang,S et al 2018 |  |  |  |  |  |  | Yes | Yes |  |  |
| Zhang et al 2015 |  |  |  |  | Yes | Yes |  |  | No | Yes |
| Zhang et al 2016 |  |  |  |  |  |  |  |  | Yes | Yes |
| Zhang et al 2016 |  |  |  |  |  |  |  |  |  |  |
| Zhou et al 2017 | Yes | Yes | Yes | Yes |  |  |  |  | Yes | Yes |
| Zimmermann et al 2018 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Zou et al 2015 |  |  |  |  |  |  | Yes | Yes |  |  |
| Sutherland et al 2013 |  |  |  |  |  |  | Yes | Yes |  |  |
| Sutherland et al 2013 |  |  |  |  |  |  |  |  | Yes | Yes |
| Contreras et al 2016CD | Yes | Yes | Yes | Yes |  |  | Yes | No |  |  |
| Contreras et al 2016PG | Yes | Yes | Yes | Yes |  |  | Yes | Yes |  |  |
| Overall | 43/43 | 42/43 | 40/43 | 42/43 | 24/24 | 23/24 | 35/36 | 32/36 | 20/23 | 23/23 |

Abbreviations: ATP: anterior thalamic projections; FAT: frontal aslant tract; IFG: inferior frontal gyrus; LN: lenticular nucleus; MCC: median cingulate cortex; RO: rolandic operculum; AN, affective network; DAN, dorsal attention network; DMN, default mode network; FPN, frontal parietal network; SSN, somatosensory network; SN, salience network.

**Table S7** Results of Jackknife Sensitivity Analysis of BA-HC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Discarded datasets** | Seed Networks and effect anatomy | | | | | | |
| FPN | | AN | | SN | | |
| Right SFG | Left PCC | Right IFG | Corpus callosum | Left MCC | Right RO | Left SMA |
| Bae et al., 2017 IGD | Yes | Yes | Yes | Yes |  |  |  |
| Bae et al., 2017 ibGD | Yes | Yes | Yes | Yes |  |  |  |
| Chen, C et al 2016 |  |  | Yes | Yes | Yes | Yes | Yes |
| Chen, J et al 2020 | Yes | Yes |  |  |  |  |  |
| Dong et al 2012 |  |  |  |  | Yes | Yes | Yes |
| Ge et al 2017 IGD | Yes | Yes |  |  |  |  |  |
| Han et al 2019 | Yes | Yes |  |  | Yes | Yes | Yes |
| Han et al 2018 | Yes | Yes |  |  |  |  |  |
| Haynos et al 2021 | Yes | Yes |  |  |  |  |  |
| Hong et al 2015 |  |  |  |  | Yes | Yes | Yes |
| Kang et al 2018 |  |  | Yes | Yes |  |  |  |
| Kim et al 2019 |  |  | Yes | Yes |  |  |  |
| Kim et al 2021 | Yes | Yes | Yes | Yes |  |  |  |
| Ko et al 2015 |  |  | Yes | Yes |  |  |  |
| Koehler et al 2013 | Yes | Yes | Yes | Yes |  |  |  |
| Lee et al 2018 IGD |  |  | Yes | Yes | Yes | Yes | Yes |
| Lee et al 2018 IGD+DEP |  |  | Yes | Yes |  |  |  |
| Lee et al 2021 |  |  |  |  | Yes | Yes | Yes |
| Lee et al 2020 |  |  |  |  | Yes | Yes | Yes |
| Lin et al 2015 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Liu et al 2021 |  |  | Yes | Yes |  |  |  |
| Liu et al 2018 |  |  | Yes | Yes |  |  |  |
| Oliva et al 2020 | Yes | Yes |  |  |  |  |  |
| Sun et al 2019 | Yes | Yes |  |  |  |  |  |
| Yuan et al 2017 |  |  | Yes | Yes |  |  |  |
| Zhang,M et al 2018 |  |  | Yes | No |  |  |  |
| Zhang,M et al 2015 |  |  | Yes | Yes |  |  |  |
| Zhang,Y\_a et al 2016 |  |  |  |  | Yes | Yes | Yes |
| Zhang et al 2016 | Yes | Yes |  |  | Yes | No | Yes |
| Contreras et al 2016PG |  |  | Yes | Yes |  |  |  |
| Overall | 12/12 | 12/12 | 17/17 | 16/17 | 10/10 | 9/10 | 10/10 |

Abbreviations: ACC: anterior cingulate cortex; IFG: inferior frontal gyrus; MCC: median cingulate cortex; PCC: posterior cingulate cortex; RO: rolandic operculum; SFG: superior frontal gyrus; SMA: supplementary motor area.

**Table S8** Results of Jackknife Sensitivity Analysis of SA-HC

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Discarded datasets** | Seed Networks and effect anatomy | | | | | | | | | | |
|  | DMN | | | | FPN | AN | SN | Thalamus | | | |
| Right IFG | Right ATP | Left striatum | Right ACC | Left IFG | Right SFG | Left fusiform gyrus | Right ACC | Left thalamus | Right SFG | Right MFG |
| Adinoff et al 2015 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Bai et a 2017 |  |  |  |  |  |  |  | Yes | Yes | No | No |
| Berlingeri et al, 2017 |  |  |  |  |  | Yes |  |  |  |  |  |
| Blanco et al., 2017 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| Camchong et al 2011 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Camchong et al 2013 | Yes | Yes | Yes | Yes |  | Yes | Yes |  |  |  |  |
| Contreras et al 2015 CD | Yes | No | Yes | Yes |  |  | Yes |  |  |  |  |
| Denier et al 2015 |  |  |  |  |  |  |  | Yes | Yes | Yes | Yes |
| Farre et al 2021 AUD | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Farre et al 2021 AUD+ADHD | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Ge et al 2017 SND |  |  |  |  | No |  |  |  |  |  |  |
| Geng et al 2017 |  |  |  |  |  | Yes | Yes |  |  |  |  |
| Gu et al 2010 | Yes | Yes | Yes | Yes |  | Yes | Yes | Yes | Yes | Yes | Yes |
| Halcomb et al 2019 |  |  |  |  |  |  | Yes |  |  |  |  |
| Kohno et al 2018 |  |  |  |  | Yes | Yes |  |  |  |  |  |
| Kohno et al 2014 |  |  |  |  |  |  |  | Yes | Yes | Yes | Yes |
| Li,Q et al 2013 | Yes | Yes | No | Yes |  |  |  |  |  |  |  |
| Liao et al 2016 |  |  |  |  |  |  |  | Yes | Yes | Yes | Yes |
| Lin et al 2018 |  |  |  |  | Yes |  |  |  |  |  |  |
| Liu et al 2019 |  |  |  |  |  |  |  | Yes | Yes | Yes | No |
| Ma et al 2010 |  |  |  |  |  | Yes |  |  |  |  |  |
| McHugh et al 2013 |  |  |  |  |  | Yes |  |  |  |  |  |
| McConnel et al 2020 |  |  |  |  |  | Yes |  |  |  |  |  |
| Motzkin et al 2014 |  |  |  |  |  | Yes |  |  |  |  |  |
| Muller et al 2015 | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |
| Pujol et al 2014 | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |
| Pitel et al 2013 |  |  |  |  | Yes |  |  |  |  |  |  |
| Qiu et al 2013 |  |  |  |  | Yes |  |  |  |  |  |  |
| Qiu et al 2016 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Shen et al 2017 |  |  |  |  |  | Yes |  |  |  |  |  |
| Shen et al 2018 |  |  |  |  |  |  | Yes |  |  |  |  |
| Verdejo et al 2014 | Yes | Yes | Yes | Yes | Yes |  |  |  |  |  |  |
| Wang et al 2017 |  |  |  |  |  |  |  | Yes | Yes | No | No |
| Wang et al 2018 |  |  |  |  | Yes |  |  | Yes | Yes | Yes | Yes |
| Wang,J et al 2016 | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |
| Wang,L et al 2016 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Wang,P et al 2016 |  |  |  |  |  |  | No |  |  |  |  |
| Wang et al 2019 |  |  |  |  |  | Yes |  |  |  |  |  |
| Wang et al 2013 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| Xie et al 2011 |  |  |  |  |  | Yes |  |  |  |  |  |
| Zhai et al 2015 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Zhai et al 2014 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Zhang,H et al 2018 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Zhang,S et al 2018 |  |  |  |  |  | No |  |  |  |  |  |
| Zhang et al 2015 | Yes | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |
| Zhou et al 2017 | Yes | Yes | Yes | Yes |  |  | Yes |  |  |  |  |
| Zimmermann et al 2018 | Yes | Yes | Yes | Yes |  |  |  |  |  |  |  |
| Zou et al 2015 |  |  |  |  |  | No |  |  |  |  |  |
| Sutherland et al 2013 |  |  |  |  |  | Yes |  |  |  |  |  |
| Sutherland et al 2013 |  |  |  |  |  |  | Yes |  |  |  |  |
| Contreras et al 2016CD | Yes | Yes | Yes | Yes |  | Yes |  |  |  |  |  |
| Overall | 23/23 | 22/23 | 22/23 | 23/23 | 11/12 | 17/19 | 12/13 | 8/8 | 8/8 | 6/8 | 5/8 |

Abbreviations: ACC: anterior cingulate cortex; ATP: anterior thalamic projections; FAT: frontal aslant tract; IFG: inferior frontal gyrus; MFG: middle frontal gyrus; SFG: superior frontal gyrus.

**Table S9** Publication bias of the clusters in rs-FC meta-analysis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| The cluster in Addiction-HC | Publication bias (funnel plot) | The cluster in BA-HC | Publication bias (funnel plot) | The cluster in BA-HC | Publication bias (funnel plot) |
| Right IFG (DMN seeds)  Bias: -1.41, t: -3.01, df: 40, p: 0.005 | 箭头  低可信度描述已自动生成 | Right SFG (FPN seeds)  Bias: 1.49, t: 1.13, df: 11, p: 0.283 | 图片包含 游戏机, 星星  描述已自动生成 | Right IFG (DMN seeds)  Bias: 0.86, t: 0.78, df: 20, p: 0.445 | 图片包含 箭头  描述已自动生成 |
| Right LN (DMN seeds)  Bias: -0.55, t: -0.73, df: 40, p: 0.470 | 图片包含 游戏机  描述已自动生成 | Right PCC (FPN seeds)  Bias: 1.49, t: 1.13, df: 11, p: 0.283 | 图片包含 游戏机, 星星  描述已自动生成 | Right ATP (DMN seeds)  Bias: 1.65, t: 1.39, df: 20, p: 0.179 | 图片包含 箭头  描述已自动生成 |
| Left FAT (DMN seeds)  Bias: -1.82, t: -3.67, df: 40, p: 0.001 | 图片包含 游戏机, 星星  描述已自动生成 | Right IFG (AN seeds)  Bias: -2.40, t: -2.58, df: 15, p: 0.021 | **图片包含 游戏机, 星星, 笔记本, 夜空  描述已自动生成** | Left striatum (DMN seeds)  Bias: 1.68, t: 1.49, df: 20, p: 0.153 | 图片包含 箭头  描述已自动生成 |
| Left ATP (DMN seeds)  Bias: 0.73, t: 2.36, df: 40, p: 0.023 | 图片包含 游戏机  描述已自动生成 | Corpus callosum (AN seeds)  Bias: -0.06, t: -0.06, df: 15, p: 0.952 | 图片包含 游戏机, 笔记本, 星星  描述已自动生成 | Right ACC (DMN seeds)  Bias: 0.07, t: 0.05, df: 20, p: 0.959 | 黑暗里有星球  描述已自动生成 |
| Left insula (FPN seeds)  Bias: -0.95, t: -1.21, df: 22, p: 0.238 | 图表  低可信度描述已自动生成 | Right MCC (SN seeds)  Bias: -0.25, t: -0.16, df: 8, p: 0.879 | 黑暗里有星球  描述已自动生成 | Left IFG (FPN seeds)  Bias: -0.37, t: -0.53, df: 11, p: 0.609 | 图片包含 箭头  描述已自动生成 |
| Left ATP (FPN seeds)  Bias: -0.65, t: -0.60, df: 22, p: 0.557 | 图片包含 游戏机, 星星  描述已自动生成 | Left MCC (SN seeds)  Bias: -1.41, t: -1.03, df: 8, p: 0.333 | 图片包含 箭头  描述已自动生成 | Right SFG (AN seeds)  Bias: -1.05, t: -1.45, df: 17, p: 0.166 | 形状, 箭头  描述已自动生成 |
| Left IFG (AN seeds)  Bias: -0.71, t: -1.56, df: 34, p: 0.127 | 图片包含 游戏机, 雨, 星星  描述已自动生成 | Right RO (SN seeds)  Bias: -2.38, t: -1.67, df: 8, p: 0.133 | 形状, 箭头  描述已自动生成 | Left fusiform gyrus (SN seeds)  Bias: 0.34, t: 0.49, df: 12, p: 0.636 | 箭头  中度可信度描述已自动生成 |
| Right IFG (AN seeds)  Bias: -1.00, t: -1.92, df: 34, p: 0.063 | 箭头  描述已自动生成 |  |  |  |  |
| Left RO (SN seeds)  Bias: -0.07, t: -0.08, df: 21, p: 0.935 | 图表  描述已自动生成 |  |  |  |  |
| Right MCC (SN seeds)  Bias: 0.29, t: 0.33, df: 21, p: 0.742 | 图片包含 游戏机, 笔记本, 电脑, 星星  描述已自动生成 |  |  |  |  |

Abbreviations: ATP: anterior thalamic projections; FAT: frontal aslant tract; IFG: inferior frontal gyrus; LN: lenticular nucleus; MCC: median cingulate cortex; MFG: middle frontal gyrus; RO: rolandic operculum; SFG: superior frontal gyrus; SLF: superior longitudinal fasciculus; STG: superior temporal gyrus; AN, affective network; DAN, dorsal attention network; DMN, default mode network; FPN, frontal parietal network; SSN, somatosensory network; SN, salience network.

**Included datasets**

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