**Perspective:** disinhibition syndrome, dysexecutive syndrome, Stroop, vigilance/oddball tasks

**Criticism**

-Assumed no inhibition in SI-C. **Inhibit trained response?**

-Is **SI contrast** due to inhibition or **response initiation?**

-Insula activity due to **uncertainty diff. Between SI+SIC**

-SI-C rare -> triggers **attentional capture?**

**Conclusion:** hypoactivity in inhibition areas for ADHD. Controlled for **confounders** (att. capture, visual rep., motor)

Behavioural evidence shows slower inhibition (SSRT) and worse attention (omission errors) in ADHD

**Trial types: Figure 1**

-Go: 66.6 %. Determine direction

-Stop-signal: 16.6 %.

-**Successful-inhibition control (SI-C):** 8.3 %. Similar **stimulus complexity** (visual processing), **frequency** (attention capture), and **lack of motor response** (inhibition) as successful inhibitions in normal stop-signal trials -> **isolates inhibition via subtraction**

-**Failed-inhibition control (FI-C):** 8.3 %. Controls same issues but allows motor response -> **isolates error related activity**

**Table 2 + Fig 2**: fMRI activation differences

**Successful inhibition** contrast (isolated inhibition activity)

-ADHD show less activity in **IFG/insula** and **ACC/anterior medial frontal cortex**

-ADHD areas for **inhibition have same activity** as TD

**Failed inhibition** contrast (isolated **error-related** activity)

-ADHD shows greater activity in **(pre-)motor areas**

**Method**: *N*=21 ADHD, 21 TD, fMRI (subtraction method), stop-signal task

-3 practice runs (1 in MRI), 8 experimental runs (x60 trials)

**Runs**: White fixation cross on black background 500 ms

-Go stimulus 1500 ms

-Inter-trial interval varies between 1000 and 5000 ms

-About **1/3** of all trials somehow included a **stop signal**

-Stop-signal: 16.6% - stop signal controls: 8.3 % x2

**-Stop-signal delay (SSD) adapted trial-by-trial to 50%**

**Table 1**: Task performance (behavioural data)

-No difference in MRT (opposite attention hypothesis)

-**SSRT**: ADHD children needed significantly longer to successfully react to stop-signals than TD

-**Omission errors**: ADHD children more often missed trials by not responding than TD (for attention hypothesis)

-No significant difference in successful inhibitions (algorithm)

**The article:** investigating inhibition mechanisms in ADHD

-Earlier studies had methodological problems -> confounders: **attentional capture- and oddball effects**.

-Several **brain areas** involved in **stop-signal tasks (inhibition)** are also active in **oddball paradigms (attention capture/surprise)** so processes are hard to tease apart.

**Motivation**: inhibition typically activates network including IFG, anterior insula, dmPFC + more

-Control for confounders of attentional capture when studying attention and inhibition in ADHD

**Hypothesis:** ADHD will show less activation in dmPFC and rIFG (it if is involved in inhibition)

-Worse inhibition (SSRT) in ADHD

-Worse attention (MRT, omission errors) in ADHD

**Executive functions**: flexible and goal-oriented control of thought and behaviour

**Four types of inhibition** (Purves): Halting well trained or previously valid behaviours; preventing irrelevant information from interfering; restraining inappropriate actions; removing irrelevant information from WM

Janssen et al (2015): Neural correlates of response inhibition in children with attention-deficit/hyperactivity disorder: A controlled version of the stop-signal task