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| **Domain:** | Substance Use-related Neurobehavioral and Cognitive Risk Factors |
| **Measure:** | Inhibitory Control (Stop Signal Paradigm) |
| **Definition:** | This measure assesses the ability of the participant to inhibit a response that has already been initiated. |
| **Purpose:** | Inhibitory control is a component of impulsivity, and poor response inhibition is a risk factor for substance use disorders (Monterosso et al., 2005; Nigg et al., 2006). |
| **Essential PhenX Measures:** | Current Age |
| **Related PhenX Measures:** | Working Memory Cognitive Flexibility (Dimensional Change Card Sort) Motor and Attentional Impulsivity (Immediate and Delayed Memory Task) Response Inhibition (Go/NoGo Task) |
| **Collections:** | Impulsivity Substance Use-related Neurobehavioral and Cognitive Risk Factors |
| **Keywords:** | Adolescent, Adult, Child, Impulsivity, Inhibitory Control, STOP-IT, Stop-Signal, Stop-signal Paradigm, Stop-Signal Task, Substance Abuse, Substance Use, Vanderbilt University, SAA, Substance Use-related Neurobehavioral and Cognitive Risk Factors, computer administered |

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| **Protocol Release Date:** | February 24, 2012 |
| **PhenX Protocol Name:** | Inhibitory Control (Stop Signal Paradigm) |
| **Protocol Name from Source:** | The Expert Review Panel has not reviewed this measure yet. |
| **Description:** | STOP-IT is a computer-administered stop-signal task. Participants react as quickly as possible to a visual stimulus unless it is followed by an auditory stop signal presented after a variable delay. STOP-IT includes an analysis module (ANALYZE-IT) that calculates several summary variables.  For more information about the stop-signal task, please refer to the [link[www.cognitiveatlas.org/task/id/tsk\_4a57abb949e1a|Cognitive Atlas Interpretation]]. |
| **Specific Instructions:** | None |
| **Protocol:** | **Summary of the STOP-IT Stop Signal Task**  The stop-signal procedure consists of a visually based primary task, followed 25 percent of the time by an auditory-based stop signal. For the primary task, participants differentiate between a square or circle by pressing a specific key as quickly as possible. The visual cues remain on the screen until the participants respond or 1,250 milliseconds (msec) expire. For the stop-signal task, the visual cue is followed, after a variable length of time (initially 250 msec), by a tone that signals to the subject not to respond. If the participant successfully inhibits their response, the stop-signal delay increases by 50 msec. If the participant does not successfully inhibit their response, the stop-signal delay decreases by 50 msec.  STOP-IT includes a practice phase of 32 trials followed by an experimental phase of three blocks of 64 trials (total). The number of practice and experimental phase trials can be adjusted.  **Scoring**  Results are written to an output file that includes block number, trial number, type of trial, whether the response was correct, reaction time, and stop signal delay. The ANALYZE-IT software calculates the means for a variety of summary variables including an estimation of stop signal reaction time (SSRT), where longer stop signal reaction time indicates greater motor impulsivity.  This program can be found at [www.psy.vanderbilt.edu/faculty/logan/#stopit](http://www.psy.vanderbilt.edu/faculty/logan/#stopit) |
| **Selection Rationale:** | The stop-signal task is a well-established, validated test of inhibitory control. STOP-IT is a freely available, precompiled executable program to perform the stop-signal task, which does not require further programming by the investigator. |
| **Source:** | Verbruggen, F., Logan, G. D., & Stevens, M. A. (2008). STOP-IT: Windows executable software for the stop-signal paradigm. *Behavior Research Methods, 40*, 479-483.  Executables for the STOP-IT task and the accompanying ANALYZE-IT analysis program can be downloaded from Gordon Logan’s website (Department of Psychology, Vanderbilt University). |
| **Life Stage:** | Adult Adolescent Child |
| **Language of source:** | English |
| **Participant:** | Adults, adolescents, and children aged 7 years or older |
| **Personnel and Training Required:** | STOP-IT can be administered by research assistants trained in the ethical and competent use of psychological tests. |
| **Equipment Needs:** | STOP-IT can be installed on computers running Windows 2000/XP. |
| **Standards:** | |  |  |  |  | | --- | --- | --- | --- | | **Standard** | **Name** | **ID** | **Source** | | Common Data Element (CDE) | Neurobehavioral Inhibitory Nerve Control Questionnaire Assessment Score | 3371867 | [CDE Browser](https://cdebrowser.nci.nih.gov/CDEBrowser/search?elementDetails=9&FirstTimer=0&PageId=ElementDetailsGroup&publicId=3371867&version=1.0) | |
| **General references:** | Boucher, L., Palmeri, T. J., Logan, G. D., & Schall, J. D. (2007). Inhibitory control in mind and brain: An interactive race model of countermanding saccades. *Psychological Review*, *114*, 376-397.  Monterosso, J. R., Aron, A. R., Cordova, X., Xu, J. S., & London, E. D. (2005). Deficits in response inhibition associated with chronic methamphetamine abuse. *Drug and Alcohol Dependence,* *79*, 273-277.  Nigg, J. T., Wong, M. M., Martel, M. M., Jester, J. M., Puttler, L. I., Glass, J. M., Adams, K. M., Fitzgerald, H. E., & Zucker, R. A. (2006). Poor response inhibition as a predictor of problem drinking and illicit drug use in adolescents at risk for alcoholism and other substance use disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 468-475.  van den Wildenberg, W. P. M., & van der Molen, M. W. (2004). Developmental trends in simple and selective inhibition of compatible and incompatible responses. *Journal of Experimental Child Psychology, 87*, 201-220.  Verbruggen, F., & Logan, G. D. (2009). Models of response inhibition in the stop-signal and stop-change paradigms. *Neuroscience & Biobehavioral Reviews, 33,* 647-661. |
| **Mode of Administration:** | Self-administered evaluation |
| **Derived Variables:** | None |
| **Requirements:** | |  |  | | --- | --- | | **Requirement Category** | **Required** | | Major equipment | No | | Specialized training | No | | Specialized requirements for biospecimen collection | No | | Average time of greater than 15 minutes in an unaffected individual | No | |
| **Process and Review:** | The Expert Review Panel has not reviewed this measure yet. |