Response Inhibition Task —Go/No-Go Task

Response Inhibition- Definition

- **Definition:** The capacity to **suppress automatic, dominant, or prepotent responses** when they are inappropriate.

- **Key Features:**

  - Stopping oneself from responding impulsively.

  - Resisting distractions or temptations.

Go/No-go task definition:

- The Go/No-Go task checks how well people can control their actions.

- Participants see words on the screen. When the word "GO" appears, they must press a key as fast as possible.

- When the word "NO-GO" appears, they must not press any key.

- The test measures how often they respond correctly, and whether they can stop themselves from pressing when "NO-GO" shows up.

☐ Example sequence: "GO" → press → "GO" → press → "NO-GO" → don't press.

For Tech team's Reference:

1. Task Overview

- **Total Blocks**: 3

- **Rounds per Block**: 25

- **Total Rounds**: 75

- **Stimuli**:

Adolescents:

- ○ **Magic Potion** □

- ○ **Bomb** □

Adults:

- ○ **Red Circle**
- ○ **Blue Circle**

2. Block Structure:

Adolescents:

- **Block 1:** Go = Potion □ → press | No-Go = Bomb □ → don't press

- **Block 2:** Go = Bomb □ → press | No-Go = Potion □ → don't press

- **Block 3:** Same as Block 1 → Potion □ = Go, Bomb □ = No-Go

Adults:

- **Block 1:**

    - ○ **Go = Red Circle □ → press**

    - ○ **No-Go = Blue Circle □ → don't press**

- **Block 2:**

    - ○ **Go = Blue Circle □ → press**

    - ○ **No-Go = Red Circle □ → don't press**

- **Block 3:**

    - ○ Same as Block 1 → **Go = Red Circle □ → press, Blue Circle □ = No-Go (don't press)**

Rounds distribution in each Block:

- ○ **60% Go-Rounds** (6 per block)

- ○ **40% No-Go Rounds**(4 per block)

3. Rounds Flow

Pre-Task Instructions (to be displayed before the task begins).

1. ## The participant first reads the Main Task Instructions

   Generic Instructions (for Both Adolescents and Adults) **(to be displayed in the interface before the task)**

   "In this game, you'll see simple symbols appear on the screen. Your job is to react quickly when the rules tell you to tap, and to hold back when the rules say not to tap. The rules may change as you go, so stay focused and be ready to adjust. Let's begin!"

   "Before the main game starts, you'll do a few practice rounds to get familiar with the task. Try to respond quickly and correctly!"

   Each time you see a plus sign (+), get ready and pay close attention for the next round."

   When you feel set to take on the challenge, tap 'Let's Go!' below and the game begins!"

2. ## The participant then reads the Practice Task Instructions.

   Adolescents (14–18)

   "In this practice round, tap the screen as fast as you can when you see a Potion □, and don't tap when you see a Bomb □. Try to respond quickly and correctly — let's see how well you can follow the rules!"

   When you feel set to take on the challenge, tap **'Let's Go!'** below and the game begins!""

"In this practice round, tap the screen when you see a Red ☐ or other Go stimuli, and don't tap when you see a Blue ☐ or No-Go stimuli. Respond quickly and accurately to learn the task!"

When you're prepared to begin the task, press **'Let's Go!'** below to start."

3. Participants complete 7 practice trials.

Practice Task Rounds-Level Flow

1. **Fixation / blank screen** – 0.3 s

2. **Stimulus presentation** – Adolescents: 2.5 s; Adults: 2 s.
a. If a choice is made: chosen stimulus is highlighted **instantly in blue**.

b. If no choice is made: display *"Time is up!"* for 1 second, then proceed.
c. **No feedback is given for either correct or wrong responses for this task.**

3. **Inter-round interval** – 0.3 s before the next round starts.

Feedback Rules for practice task:

To enable participants to understand whether they are doing the tak correctly or not.

(a) Correct Go Response (Pressed when required):

● Show message: **"Good job! You pressed at the right time."**

● Display duration: **1 s**

(b) Missed Go Response (Did not press when should have):

● Show message: **"Remember to press when you see the Go picture!"**

● Duration: **1.5 s**

● Optional: play a **gentle alert tone**

(c) Incorrect No-Go Response (Pressed when should not have):

- Show message: **"Try not to press when you see the No-Go picture."**

- Duration: **1.5 s**

**(d) Correct No-Go Response (Successfully inhibited press):**

- Show message: **"Great! You stopped at the right time."**

- Duration: **1 s**

(e) No Response / Inactivity Alert

If **no response within 1.5 s (adults)** or **2 s (adolescents)** of stimulus onset:

- Play **"beep" tone**

- Show text: **"Please respond quickly!"**

- Duration: **1 s**

 Practice Task Trial Flow- Adolescents and Adults Version (to be displayed in the interface before the main task in the same order)

Trial	Adolescents Stimulus	Adolescents Rule	Adolescent Time (s)	Adults Stimulus	Adults Rule	Adult Time (s)
1	Bomb ☐	Don't Tap (No-Go)	2.5	Red ☐	Tap (Go)	2
2	Potion ☐	Tap (Go)	2.5	Blue ☐	Don't Tap (No-Go)	2
3	Potion ☐	Tap (Go)	2.5	Red ☐	Tap (Go)	2

4	Bomb ☐	Don't Tap (No-Go)	2.5	Red ☐	Tap (Go)	2
5	Potion ☐	Tap (Go)	2.5	Blue ☐	Don't Tap (No-Go)	2
6	Bomb ☐	Don't Tap (No-Go)	2.5	Blue ☐	Don't Tap (No-Go)	2
7	Potion ☐	Tap (Go)	2.5	Red ☐	Tap (Go)	2

4. After practice, a **one-line instruction** appears, where participants are then directed to the main task.

Adolescents (14–18 years)

"Great job finishing the practice! Now get ready for the real task. Tap **'Let's Go!'** below and the game begins!""

Adults (18–22 years)

"Great job finishing the practice! Now get ready for the real task. Tap **'Let's Go!'** below and the game begins!""

5 . Participants then proceed to the Main Task

Main Task (Block Structure)

Main Task Rounds Flow- same flow as the practice task.

- The main task is divided into 3 blocks.

- At the start of each block, a short instruction screen appears, explaining the specific block. (Mentioned below).

- After reading the block instructions, participants are directed into the next block.

Main Task Flow Table -Adolescent Version (to be displayed in the interface in same order)

"Welcome! In this game, you'll see two designs appear — a magic potion □ or a bomb □.

- *If you see a potion □, tap it as fast as you can.*

- *If you see a bomb □, don't touch the screen.*

- *You'll need to react quickly.*

- *Stay sharp! Sometimes you'll need to act, and sometimes you'll need to stop yourself.*

- *There are three rounds. Let's begin the first one — good luck!"*

When you feel set to take on the challenge, tap **'Let's Go!'** below and the game begins!""

Trial Number	Stimulus	Rule	Response Time
1	Bomb □	Don't Tap (No-Go)	2.5 s
2	Potion □	Tap (Go)	2.5 s
3	Potion □	Tap (Go)	2.5 s
4	Bomb □	Don't Tap (No-Go)	2.5 s
5	Potion □	Tap (Go)	2.5 s

6	Potion ☐	Tap (Go)	2.5 s
7	Bomb ☐	Don't Tap (No-Go)	2.5 s
8	Bomb ☐	Don't Tap (No-Go)	2.5 s
9	Potion ☐	Tap (Go)	2.5 s
10	Potion ☐	Tap (Go)	2.5 s
11	Potion ☐	Tap (Go)	2.5 s
12	Potion ☐	Tap (Go)	2.5 s
13	Bomb ☐	Don't Tap (No-Go)	2.5 s
14	Potion ☐	Tap (Go)	2.5 s
15	Bomb ☐	Don't Tap (No-Go)	2.5 s
16	Potion ☐	Tap (Go)	2.5 s
17	Potion ☐	Tap (Go)	2.5 s
18	Bomb ☐	Don't Tap (No-Go)	2.5 s
19	Potion ☐	Tap (Go)	2.5 s

Trial Number	Stimulus	Rule	Response Time
20	Bomb □	Don't Tap (No-Go)	2.5 s
21	Potion □	Tap (Go)	2.5 s
22	Potion □	Tap (Go)	2.5 s
23	Bomb □	Don't Tap (No-Go)	2.5 s
24	Potion □	Tap (Go)	2.5 s
25	Bomb □	Don't Tap (No-Go)	2.5 s

"Great job! Now the rules are changing.

- *This time, if you see a bomb □, you must tap it fast.*

- *If you see a potion □, don't tap.*

- *Keep your focus — the game is trickier now!"*

When you feel set to take on the challenge, tap **'Let's Go!'** below and the game begins!""

Trial Number	Stimulus	Rule	Response Time
26	Bomb □	Tap (Go)	2.5 s
27	Potion □	Don't Tap (No-Go)	2.5 s

28	Bomb ☐	Tap (Go)	2.5 s
29	Bomb ☐	Tap (Go)	2.5 s
30	Potion ☐	Don't Tap (No-Go)	2.5 s
31	Bomb ☐	Tap (Go)	2.5 s
32	Potion ☐	Don't Tap (No-Go)	2.5 s
33	Potion ☐	Don't Tap (No-Go)	2.5 s
34	Bomb ☐	Tap (Go)	2.5 s
35	Bomb ☐	Tap (Go)	2.5 s
36	Bomb ☐	Tap (Go)	2.5 s
37	Potion ☐	Don't Tap (No-Go)	2.5 s
38	Bomb ☐	Tap (Go)	2.5 s
39	Bomb ☐	Tap (Go)	2.5 s
40	Potion ☐	Don't Tap (No-Go)	2.5 s
41	Bomb ☐	Tap (Go)	2.5 s

Trial Number	Stimulus	Rule	Response Time
42	Potion ☐	Don't Tap (No-Go)	2.5 s
43	Bomb ☐	Tap (Go)	2.5 s
44	Bomb ☐	Tap (Go)	2.5 s
45	Potion ☐	Don't Tap (No-Go)	2.5 s
46	Bomb ☐	Tap (Go)	2.5 s
47	Potion ☐	Don't Tap (No-Go)	2.5 s
48	Bomb ☐	Tap (Go)	2.5 s
49	Bomb ☐	Tap (Go)	2.5 s
50	Potion ☐	Don't Tap (No-Go)	2.5 s

"Final round! The rules are back to how they were at the beginning.

- *Tap for potion ☐, don't tap for bomb ☐.*

- *Play carefully and finish strong!"*

When you feel set to take on the challenge, tap **'Let's Go!'** below and the game begins!""

Trial Number	Stimulus	Rule	Response Time

51	Bomb ☐	Don't Tap (No-Go)	2.5 s
52	Potion ☐	Tap (Go)	2.5 s
53	Potion ☐	Tap (Go)	2.5 s
54	Bomb ☐	Don't Tap (No-Go)	2.5 s
55	Potion ☐	Tap (Go)	2.5 s
56	Bomb ☐	Don't Tap (No-Go)	2.5 s
57	Potion ☐	Tap (Go)	2.5 s
58	Potion ☐	Tap (Go)	2.5 s
59	Bomb ☐	Don't Tap (No-Go)	2.5 s
60	Potion ☐	Tap (Go)	2.5 s
61	Bomb ☐	Don't Tap (No-Go)	2.5 s
62	Potion ☐	Tap (Go)	2.5 s
63	Bomb ☐	Don't Tap (No-Go)	2.5 s

64	Potion ☐	Tap (Go)	2.5 s
65	Potion ☐	Tap (Go)	2.5 s
66	Bomb ☐	Don't Tap (No-Go)	2.5 s
67	Potion ☐	Tap (Go)	2.5 s
68	Bomb ☐	Don't Tap (No-Go)	2.5 s
69	Potion ☐	Tap (Go)	2.5 s
70	Potion ☐	Tap (Go)	2.5 s
71	Bomb ☐	Don't Tap (No-Go)	2.5 s
72	Potion ☐	Tap (Go)	2.5 s
73	Bomb ☐	Don't Tap (No-Go)	2.5 s
74	Potion ☐	Tap (Go)	2.5 s
75	Potion ☐	Tap (Go)	2.5 s

Main Task Flow Table- Adults Version (to be displayed in the interface in same order)

"Welcome! This is a quick reaction game. You'll see a red circle ☐ or a blue circle ☐ appear.

- *If it's red ☐, tap it fast.*

- *If it's blue ☐, don't tap.*

- *You won't have much time, so react quickly before the game moves on.*

- *There are three rounds — let's start with the first one!"*
- When you're prepared to begin the task, press **'Let's Go!'** below to start."

Trial Number	Stimulus	Rule	Response Time
1	Red ☐	Tap (Go)	2.0 s
2	Blue ☐	Don't Tap (No-Go)	2.0 s
3	Red ☐	Tap (Go)	2.0 s
4	Red ☐	Tap (Go)	2.0 s
5	Red ☐	Tap (Go)	2.0 s
6	Red ☐	Tap (Go)	2.0 s
7	Blue ☐	Don't Tap (No-Go)	2.0 s
8	Blue ☐	Don't Tap (No-Go)	2.0 s
9	Red ☐	Tap (Go)	2.0 s

10	Red ☐	Tap (Go)	2.0 s
11	Blue ☐	Don't Tap (No-Go)	2.0 s
12	Red ☐	Tap (Go)	2.0 s
13	Blue ☐	Don't Tap (No-Go)	2.0 s
14	Red ☐	Tap (Go)	2.0 s
15	Blue ☐	Don't Tap (No-Go)	2.0 s
16	Red ☐	Tap (Go)	2.0 s
17	Red ☐	Tap (Go)	2.0 s
18	Blue ☐	Don't Tap (No-Go)	2.0 s
19	Red ☐	Tap (Go)	2.0 s
20	Blue ☐	Don't Tap (No-Go)	2.0 s
21	Red ☐	Tap (Go)	2.0 s
22	Red ☐	Tap (Go)	2.0 s

23	Blue ☐	Don't Tap (No-Go)	2.0 s
24	Red ☐	Tap (Go)	2.0 s
25	Blue ☐	Don't Tap (No-Go)	2.0 s

"Nice work on Round 1! The rules are changing now.

- *If it's blue ☐, tap it fast.*

- *If it's red ☐, don't tap.*

- *Stay alert.*
- When you're prepared to begin the task, press **'Let's Go!'** below to start."

Trial Number	Stimulus	Rule	Response Time
26	Blue ☐	Tap (Go)	2.0 s
27	Red ☐	Don't Tap (No-Go)	2.0 s
28	Blue ☐	Tap (Go)	2.0 s
29	Blue ☐	Tap (Go)	2.0 s
30	Red ☐	Don't Tap (No-Go)	2.0 s

31	Blue ☐	Tap (Go)	2.0 s
32	Red ☐	Don't Tap (No-Go)	2.0 s
33	Red ☐	Don't Tap (No-Go)	2.0 s
34	Blue ☐	Tap (Go)	2.0 s
35	Blue ☐	Tap (Go)	2.0 s
36	Blue ☐	Tap (Go)	2.0 s
37	Red ☐	Don't Tap (No-Go)	2.0 s
38	Blue ☐	Tap (Go)	2.0 s
39	Blue ☐	Tap (Go)	2.0 s
40	Red ☐	Don't Tap (No-Go)	2.0 s
41	Blue ☐	Tap (Go)	2.0 s
42	Red ☐	Don't Tap (No-Go)	2.0 s
43	Blue ☐	Tap (Go)	2.0 s
44	Blue ☐	Tap (Go)	2.0 s

Trial Number	Stimulus	Rule	Response Time
45	Red □	Don't Tap (No-Go)	2.0 s
46	Blue □	Tap (Go)	2.0 s
47	Red □	Don't Tap (No-Go)	2.0 s
48	Blue □	Tap (Go)	2.0 s
49	Blue □	Tap (Go)	2.0 s
50	Red □	Don't Tap (No-Go)	2.0 s

"Final round! We're going back to the first rule.

- *Tap when you see red □.*

- *Don't tap when you see blue □.*

- *Be quick and accurate to finish strong!"*
- When you're prepared to begin the task, press **'Let's Go!'** below to start."

Trial Number	Stimulus	Rule	Response Time
51	Blue □	Don't Tap (No-Go)	2.0 s

52	Red ☐	Tap (Go)	2.0 s
53	Red ☐	Tap (Go)	2.0 s
54	Blue ☐	Don't Tap (No-Go)	2.0 s
55	Red ☐	Tap (Go)	2.0 s
56	Red ☐	Tap (Go)	2.0 s
57	Red ☐	Tap (Go)	2.0 s
58	Blue ☐	Don't Tap (No-Go)	2.0 s
59	Blue ☐	Don't Tap (No-Go)	2.0 s
60	Red ☐	Tap (Go)	2.0 s
61	Red ☐	Tap (Go)	2.0 s
62	Blue ☐	Don't Tap (No-Go)	2.0 s
63	Red ☐	Tap (Go)	2.0 s
64	Blue ☐	Don't Tap (No-Go)	2.0 s
65	Red ☐	Tap (Go)	2.0 s

66	Red ☐	Tap (Go)	2.0 s
67	Blue ☐	Don't Tap (No-Go)	2.0 s
68	Red ☐	Tap (Go)	2.0 s
69	Blue ☐	Don't Tap (No-Go)	2.0 s
70	Red ☐	Tap (Go)	2.0 s
71	Red ☐	Tap (Go)	2.0 s
72	Blue ☐	Don't Tap (No-Go)	2.0 s
73	Red ☐	Tap (Go)	2.0 s
74	Blue ☐	Don't Tap (No-Go)	2.0 s
75	Red ☐	Tap (Go)	2.0 s

6. After the participant completes all the blocks, we would give instructions that emphasize the end of this task.

Adolescents (14–18 years)

"Awesome work! You've completed this challenge — stay sharp, the next one is coming up!"

Adults (18–22 years)

"Well done! You've successfully finished this task — let's move on to the next part."

4. **Technical Implementation Notes**

- **Background**: White.

- **Stimulus position**: Center of screen, fixed.

- **Highlight**: Light blue outline immediately on tap.

- **Block transitions**:

  - Instruction screen appears before Block 2 and Block 3 to remind rule changes.

5. Scoring Instructions for the tech team:
Data Columns Required (will not be shown to participants for interpretation, for our assessment use):

- **Round Number:** Identifier for each round.
- **Block Number:** Indicates the current task block
- **Round Type:** Specify as "Go" or "No-Go" for each round.
- **Participant Response:** Indicate whether the participant responded or withheld response.
- **Response Accuracy:** Record score for each round (1 = correct response, 0 = wrong response).
- **Reaction Time (RT):** Time in seconds from stimulus onset to participant response (only for Go trials with response).

Scoring each Round:
- When the trial type is Go, and the participant responds, assign a score of 1 (Correct Go Response).
- When the trial type is Go, and the participant does not respond, assign a score of 0 (Missed Go Response).
- When the trial type is No-Go, and the participant withholds response, assign a score of 1 (Correct No-Go Response or Successful Inhibition).

- When the trial type is No-Go, and the participant responds, assign a score of 0 (Incorrect No-Go Response or Commission Error).

Additional Scoring Parameters:

- **Total Rounds Answered:** Count of all rounds attempted.
- **Total Rounds not Answered:** Count of all rounds not attempted.
- **Correct Responses:** Sum of all correct responses (Go correct + No-Go correct).
  - **Correct Responses of Go round:** Sum of all correct responses (Go correct).
  - **Correct Responses of No-Go round:** Sum of all correct responses (No-Go correct).
- **Incorrect Responses:** Sum of all incorrect responses (Go correct + No-Go incorrect).
  - **Incorrect Responses of Go round:** Sum of all incorrect responses (Go correct).
  - **Incorrect Responses of No-Go round:** Sum of all incorrect responses (No- Go correct).

- **Hit Rate:** The percentage of correct responses made to Go trials.
- **Hit Rate**=Correct Go Responses/ Total Go Trials×100
- **Go Trials Accuracy (correct responses on Go trials)**
- **Accuracy$_{Go}$**=Correct Responses on Go trialsTotal Go trials×100
- **No-Go Trials Accuracy (correct inhibitions on No-Go trials):**
- **Accuracy No−Go**=Correct Responses on No-Go trialsTotal No-Go trials×100
- **Overall Accuracy for Go/No-Go Task:**
- **Accuracy$_{Overall}$**=Total Correct Responses/ Total Trials×100
- **Commission Error: Commission Error is when someone does something wrong or inappropriate, like giving a wrong answer or responding when they should not.** Number of times participants responded to No-Go trials (wrong responses), give a total estimate in the end.
- **False Alarm / Commission Error Rate:** The percentage of incorrect responses made to No-Go trials.
- **False Alarm (Commission) Error Rate**=Responses on No-Go TrialsTotal No-Go Trials×100
- **Omission Errors: Omission Error is when someone fails to do something they were supposed to do.** Number of times participants failed to respond on Go trials (missed responses), give a total estimate in the end.

- **Omission Error Rate:** The percentage of missed responses on Go trials.
- **Omission Error Rate**=Missed Go Responses/ Total Go Trials×100.
- **Go Trials Mean Reaction Time:** Average response time for all correctly responded Go trials.
- **No-Go Trials Mean Reaction Time:** Average response time for false alarm responses (incorrect responses on No-Go trials), if any.
- **Overall Task Mean Reaction Time:** Average response time across all trials where a response was given, including correct Go responses and any No-Go false alarms.