# Experiment Bank – PsychoPy Builder

I am working on building up a bank of experiments to allow students to run experimental projects with more ease, and to relieve some of the burden upon all of us. To this end if you have a task developed in either E-Prime or PsychoPy that you would be happy for others to use and/or make alterations to, please provide the details to [penning@hope.ac.uk](mailto:penning@hope.ac.uk?subject=Experiment%20Bank)

Students and supervisors may wish to add their successful tasks to this bank, again please contact Glen ([penning@hope.ac.uk](mailto:penning@hope.ac.uk)) to discuss this.

### Lexical Decision Task

In a basic lexical decision task (LDT), a participant needs to make a decision about whether combinations of letters are words or not. For example, when you see the word "GIRL", you respond "yes, this is a real English word", but when you see the letters "XLFFE" you respond "No, this is not a real English word".

In an extension of the simple lexical decision task Meyer and Schvaneveldt (1970) presented pairs of words. Their study aimed to understand how long-term memory is organized and how we retrieve information from it. In the original study, Meyer and Schvaneveldt found that people respond more quickly to words that are related in their meaning than to words that are entirely unrelated. This demonstrates that reading a word "activates" related information that facilitates the recognition of other related words. They also added a nonword condition where the word pairs either contained 1 nonword and a real word. Or a pair of nonwords.

Design: Within Participant

IV Conditions:

Word Pairs

Levels:

Related

Unrelated

Nonwords

DV Outcomes:

Mean RT

Accuracy

Practice

Fixation cross (250ms)

Stimulus presentation (until keypress)

Feedback (correct/incorrect 1000ms)

ISI (300ms)

N Trials = 8

related = 2

unrelated = 2

with a nonword = 4 (2 pairs nonwords and two pairs with 1 nonword and 1 real word)

Trials

Fixation cross (250ms)

Stimulus presentation (until keypress)

ISI (300ms)

N Trials = 36

related = 12

unrelated = 12

with a nonword = 12 (6 pairs nonwords and 6 pairs with 1 nonword and 1 real word counterbalance for top presentation position)

### Deary Liewald Simple Reaction Time

A simple reaction time task where a participant is presented with a fixation cross of variable duration, a single stimulus on the screen and they must respond as fast as they can to the stimulus.

There are 8 practice trials with participant feedback (correct with RT and too slow if they time out. Response time outs are also variable (between 1 and 3 seconds)

Details can be modified

### Deary Liewald Choice Reaction Time (Runs on Pavlovia but stimulus sizing require modification

A basic choice reaction time task where a participant is presented with a fixation cross of variable duration, a set of 4 boxes on screen, one of which contains an x. Participants must respond with z, x, n ,m depending upon the position of the x.

There are 12 practice trials with participant feedback (correct with RT and too slow if they time out. Response time outs are also variable (between 1 and 3 seconds) and There are currently 48 experimental trials.

Details can be modified

### Implicit Association Test (IAT) (Not currently running online)

When taking an IAT you are asked to quickly sort words into categories that are on the left- and right-hand side of the computer screen by pressing the **m** key if the word belongs to the category on the left and the **z** key if the word belongs to the category on the right. The IAT has five main parts.

In the first part of the IAT, you sort words relating to the concepts (e.g., fat people, thin people) into categories. So, if the category “Black People” was on the left, and a picture of a Black person appeared on the screen, you would press the **m** key.

In the second part of the IAT, you sort words relating to the evaluation (e.g., good, bad). So, if the category “good” was on the left, and a pleasant word appeared on the screen, you would press the m key.

In the third part of the IAT, the categories are combined, and you are asked to sort both concept and evaluation words. So, the categories on the left-hand side would be Fat People/Good Words and the categories on the right-hand side would be Thin People/Bad Words. It is important to note that the order in which the blocks are presented varies across participants, so some people will do the Fat People/Good Words, Thin People/Bad Words part first and other people will do the Fat People/Bad Words, Thin People/Good Words part first.

In the fourth part of the IAT, the placement of the concepts switches. If the category “Black People” was previously on the left, now it would be on the right. Importantly, the number of trials in this part of the IAT is increased to minimize practice effects.

In the final part of the IAT, the categories are combined in a way that is opposite to what they were before. If the category on the left was previously Black People/Good Words, it would now be Black People/Bad Words.

This test can be used to measure many different constructs related to attitudes and stereotyping.

Project Implicit gives some examples of published work using the IAT <https://www.projectimplicit.net/resources/study-materials/>

### Flanker (Runs on Pavlovia)

In a Flanker task the participant is asked to focus on a central target that faces left/right or up/down and is ‘flanked’ by stimuli that are either congruent (facing the same direction) or incongruent (facing the opposite direction).

For more information about the Flanker task <https://www.sciencedirect.com/topics/psychology/flanker-task> Task can also include a neutral condition and various manipulations can be made re the target and flanking stimuli.

The Flanker Task is similar to the one described in Christ, Kester, Bodner and Miles (2011) and measures resistance to distractor interference.

A centrally placed arrow is flanked by four more arrows, two at each side. The flanker arrows either face the same direction as the central arrow (congruent) or face the opposite direction to the central arrow (incongruent).

Procedure:

IV Conditions: Congruent/Incongruent

DV Outcomes: Mean RT/Error percentage of incongruent trials - congruent trials /Accuracy

Practice

Fixation cross (500ms)

Target stimulus (3000ms)

ISI (1000ms)

Feedback (correct/incorrect)

N Trials = 20

Congruent = 10

Incongruent = 10

Trials

Fixation cross (500ms)

Target stimulus (3000ms)

ISI (250ms)

N Trials = 120

Congruent = 60

Incongruent = 60

Reference:

Christ, S. E., Kester, L. E., Bodner, K. E., & Miles, J. H. (2011). Evidence for selective inhibitory impairment in individuals with autism spectrum disorder. Neuropsychology, 25(6), 690.

### Cognitive Flexibility/MultiTasking (exec function) (Runs on Pavlovia)

This test measures executive function. There are 3 conditions (Shapes/Dots/Switching) and you can measure reaction time and accuracy. There is a practice trial for each condition.

The task presents two rectangles, one on top of the other and giving the participant a rule to apply when they see a shape in one of the boxes (press z for a DIAMOND and m for a SQUARE), then it switches the rule by presenting dots in the upper or lower box (z for 2 dots and m for 3 dots). The dots are enclosed in an outline of a shape, but these must be ignored, and response is only to the dots. Typically on these two conditions there is no significant difference between the shapes/dots, however in children we sometimes find a significant difference.

In the third condition the rules are combined , as follows: If you see a DIAMOND in the UPPER rectangle, you should press the z key, if you see a SQUARE in the UPPER rectangle you should press the m key. If you see any shape with TWO DOTS in the LOWER rectangle you should press the z key, if you see any shape with THREE DOTS in the LOWER rectangle you should press the m key. For more information <https://bmcpsychology.biomedcentral.com/articles/10.1186/2050-7283-1-18>

In analysing the data, if there is no significant difference between the shapes/dots, these can be combined for a total simple task score to be compared with the task switching condition. If there is a significant difference it may be more appropriate to run an ANOVA to compare conditions.

### Go No Go (Runs on Pavlovia)

Go/No-Go testing is often used as a component of a behavioural neurological examination to assess inhibitory control. The participant is presented with a series of target stimuli which they must respond to with a simple keypress, but when they see a pre-identified, very infrequent stimulus, they must withhold the prepotent response of the keypress.

Accuracy and RT are measured and for more information refer to <https://www.flexiblemeasures.com/nogo/> Stimuli can be manipulated to measure inhibitory control in different settings.

### Colour and emotion perception

This task can be manipulated in many ways. Images or text, different emotions etc.

A question appears in the centre of the screen with a sliding scale below. The scale is numbered 1-7 (this can be altered) and has two anchor points with a high response rating suggesting the statement is more fear inducing.

Procedure:

IV Conditions:

Control/Danger colours/Harmless colours

DV Outcomes:

Rating

Trials

Target stimulus (until slider response)

ISI (250ms)

### Slider for Likert Responses (Runs on Pavlovia)

This task is a questionnaire using a slider rating scale to collect Likert type responses.

The questions in this task are related to sincerity, valor, sentimentality as predictors of helping behaviours. (Questions from IPIP, but modifications to other questionnaires is possible)

Design:

Correlational

Predictors:

Sentimentality (n items = 10)

Valor (n items = 10)

Sincerity (n items = 10)

Rating scales = 1 not at all like me to 5 very like me

Outcomes:

Helping Behaviours (n items = 20)

Rating scale = 1 strongly disagree to 5 strongly agree

Trials

Blank Screen (250ms)

Question (until mouse response)

Blank Screen (250ms)

### Gender Neutrality (lexical and syntactical ambiguity)

Participants were given sentences one clause at a time and asked to interpret the sentence. Sentences contained a definite ("teacher") or indefinite ("someone") antecedent and a pronoun, either definite ("he" or "she") or indefinite ("they"). The experimenters found that participants could read sentences with "they" as quickly as sentences with a pronoun that did match the stereotypical antecedent and faster than those where the pronoun did not match.

Reference: Foertsch, J., and Gernsbacher, M.A. (1997). In search of gender neutrality: Is singular They a cognitively efficient substitute for generic He? *Psychological Science, 8,* 106-111.

### Stroop Task

In this task participants must report the colour of the letters spelling each word, but letters themselves also spell a colour name and this may be the same or different to the colour of the letters. Stroop (1935) reports that reaction times are slower the letters spell a colour that is incongruent with the colour of the letters, indicating a compulsory automated reading of the word.

Reference: Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of experimental psychology, 18*(6), 643.

### Emotional Stroop

The emotional Stroop effect serves as an information processing approach to emotions. In an emotional Stroop task, an individual is given negative emotional words like "grief," "violence," and "pain" mixed in with more neutral words like "clock," "door," and "shoe".Just like in the original Stroop task, the words are coloured and the individual is supposed to name the color. Research has revealed that individuals that are depressed are more likely to say the color of a negative word slower than the color of a neutral word. While both the emotional Stroop and the classic Stroop involve the need to suppress irrelevant or distracting information, there are differences between the two. The emotional Stroop effect emphasizes the conflict between the emotional relevance to the individual and the word; whereas, the classic Stroop effect examines the conflict between the incongruent color and word.  The emotional Stroop effect has been used in psychology to test implicit biases such as racial bias via an implicit-association test. A notable study of this is Project Implicit from Harvard University which administered a test associating negative or positive emotions with pictures of race and measured the reaction time to determine racial preference.

### Template for randomising order of condition presentation

This is not a complete experiment. It is a starter template to allow you to randomise a number of conditions in an experiment.

### Test of Reception of Grammar (TROG)

This is a short form version of Bishop’s Test for Reception of Grammar. Children hear a sentence, which is followed by three images. The participant must respond by clicking on the image that represents the sentence they heard.

There are 12 trials.

### Wason Selection Task

There are four cards, each of which has a stimulus on one side and a different stimulus on the other. These stimuli can be abstract or concrete.

The cards lie on a table with the following faces showing: Number, Number, WordType, WordType. The task is to identify which cards need to be turned over in order to test the truth of the following proposition: “If one of these cards has an even number on one side then its other side is a vowel.” Which cards would you turn over, without turning over any cards unnecessarily?

The Wason task is difficult in part because it tests abstract logical reasoning. Many people perform better on a similar test based on a real-life scenario.