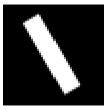
# Psychophysics: Experiment Report

## The Role of Categorization in Visual Search for Orientation: 'Left' as a category

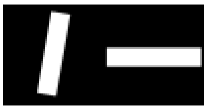
No. of Subjects who completely the survery satisfactorily : 8

### Experiment Description

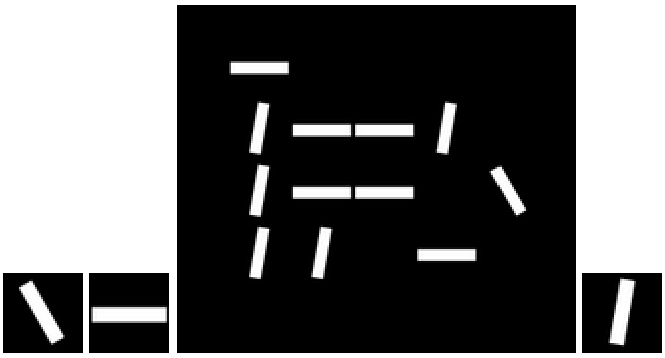
**Experiment 1**



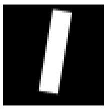
Target = 'Left': -30 degree orientation.



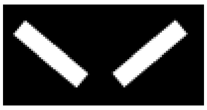
Distractors = 10, 90 degree



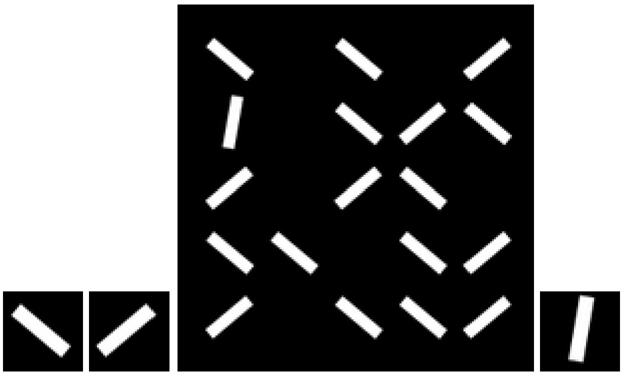
**Experiment 2**



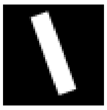
Target = 'Steep': 10 degree.



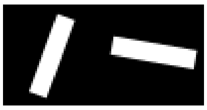
Distractors = -50, 50 degree.



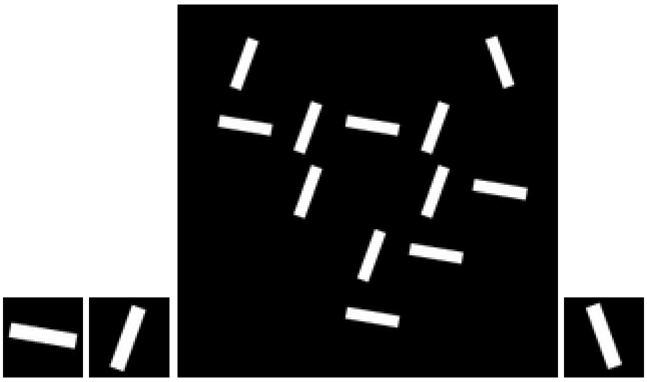
**Experiment 3**



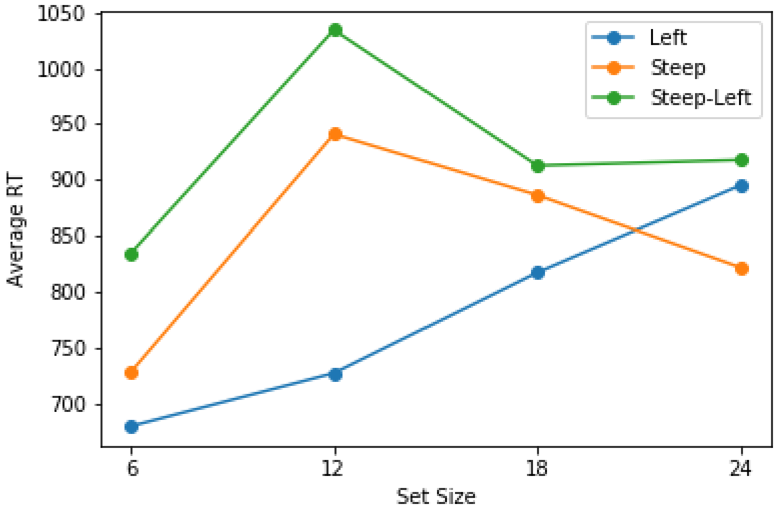
Target = 'Steep-Left': -20 degree.



Distractors = 20, -80 degree.



### Average Reaction Time vs Set Size Plots



## Reaction Time Statistics

### Experiment 1

| Set size | Mean | Median | Mode | Std. Dev. |
|---|---|---|---|---|
| 6 | 679.575 | 620.5 | 629.412 | 299.859 |
| 12 | 727.127 | 616.0 | 559.46 | 389.43 |
| 18 | 817.25 | 687.0 | 545.45 | 360.0 |
| 24 | 895.038 | 776.0 | 573.33 | 407.857 |

### Experiment 2

| Set size | Mean | Median | Mode | Std. Dev. |
|---|---|---|---|---|
| 6 | 728.125 | 564.0 | 474.074 | 363.399 |
| 12 | 940.962 | 784.0 | 680.0 | 507.805 |
| 18 | 886.387 | 670.5 | 575.0 | 619.54 |
| 24 | 821.887 | 686.5 | 588.88 | 453.911 |

### Experiment 3

| Set size | Mean | Median | Mode | Std. Dev. |
|---|---|---|---|---|
| 6 | 834.544 | 657.0 | 477.777 | 530.9 |
| 12 | 1034.35 | 865.5 | 650.0 | 611.10 |
| 18 | 912.810 | 735.0 | 570.0 | 534.93 |

| Set size | Mean | Median | Mode | Std. Dev. |
|---|---|---|---|---|
| 24 | 917.844 | 786.0 | 655.55 | 546.257 |

## Subject Reliability

**No. of correct non-responses in target-absent trials:**

| Set size | Exp1 | Exp2 | Exp3 |
|---|---|---|---|
| 6 | 39 | 37 | 39 |
| 12 | 37 | 35 | 39 |
| 18 | 40 | 39 | 38 |
| 24 | 40 | 37 | 38 |

**No. of correct responses in target-present trials:**

| Set size | Exp1 | Exp2 | Exp3 |
|---|---|---|---|
| 6 | 80 | 80 | 79 |
| 12 | 79 | 79 | 80 |
| 18 | 80 | 80 | 79 |
| 24 | 80 | 80 | 77 |

## Code Snippets

**Reading Exp Data**

```
data = pd.read_csv("data/data.csv", sep=",").values
exp_data = []
for i in range(len(data)):
    val = pd.read_csv("data/" + data[i, 4], sep=" ", header=None).values
    exp_data.append(val)
```

**Preprocessing, separating trials by type and set size**

```
data = []
for i in range(len(exp_data)):
    for j in range(len(exp_data[i])):
        data.append(exp_data[i][j][1:])

tar_sets = [[],[],[],[]]
emp_sets = [[],[],[],[]]
for i in range(len(data)):
    if(data[i][0] < 100):
        tar_sets[int((data[i][0]-6)/6)].append(data[i][1:])
    else:
        emp_sets[int((data[i][0]-106)/6)].append(data[i][1:])
```

#### Filtering correct trials

```
right_tar = [[],[],[],[]]
right_emp = [[],[],[],[]]
for i in range(len(tar_sets)):
    c = 0
    w = 0
    for j in range(len(tar_sets[i])):
        if(tar_sets[i][j][0] == 1):
            c = c + 1
            right_tar[i].append(tar_sets[i][j][1])
    for j in range(len(emp_sets[i])):
        if(emp_sets[i][j][0] != 1):
            w = w + 1
            right_emp[i].append(emp_sets[i][j][1])
    print(c, w)
```

#### Getting statistics

```
for i in range(len(right_tar)):
    print(right_tar[i].sort())
    bins = [i for i in range(0, 4100, 100)]
    labels = ['{}-{}'.format(x, y-.1) for x,  y in zip(bins[:], bins[1:])]
    frame = pd.Series(right_tar[i])
    ncut = pd.cut(frame, bins=bins, labels=labels, right=False)
    freq = lambda x: len(x) / x.sum()
    freq.__name__ = 'freq'
    out = pd.concat([ncut, frame], axis=1).groupby(0).agg(['size', 'std',
'mean', freq])
    print(frame.mean())
    print(frame.median())
    print(frame.std())
    print(out)
```