

# UFOV®

UFOV® User's Guide®

## **TRAINING**

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## TRAINING

### Accessing the Training Software

The training software may be accessed by selecting the Training button on the Main Menu. There are three broad categories of training activities available: Processing Speed Training, Divided Attention Training, and Selective Attention Training.

### Overview

Since individuals vary in their ability to perform the processing speed (Task 1), divided attention (Task 2), and selective attention (Task 3) tasks of the UFOV<sup>®</sup>, training is tailored to each individual's needs. The screening results will be your guide in determining where an individual's attentional training should begin. For each task, the screening score represents the minimum duration (in ms) at which the individual was able to perform the task correctly 75 % of the time. The directions, which follow, set forth-training goals for each of these measures.

If the participant has more than one area in need of training, training on the tasks should be progressive. For example, if all three abilities are deficient, processing speed training should occur first, divided attention should occur next, and selective attention training should occur last. A general rule to follow is to start training at a level at which the individual is successful. More detail of how training should progress for each task follows in the sections below.

### Processing Speed Training

#### Overview

Selection of this choice limits training to the center task only. There are three central tasks available for practice. These tasks, in order of increasing difficulty are: 1)Present/Absent - the participant must merely determine if an object was present or not in the center box; 2)Identify - the participant must determine which of two objects was present in the center box; and 3)Same/Different - two objects are presented in the center box and the participant must determine if the objects are the same or different.

Unlike the other training tasks, you do not select the speed at which to start training. The training block (approximately 25 trials) consists of the center task being presented through a cycle of durations ranging between 350 and 16 ms. The datum from a block of training on this task will be the minimum duration at which the participant could correctly perform the center task 75% of the time.

### Task Mastery Criteria

Training on this task should continue until the average duration is less than 30 ms for each of the three types of center tasks.

### **General Training Strategy**

For all individuals who require training on this task, start with 2 blocks of training at the least difficult of the three tasks where they are having difficulty. Individuals who are near the threshold of 30 ms (e.g. 31-40 ms) usually do not require much practice on this task. For the individual who is scoring near the goal (< 30 ms), continue providing practice in small sets of 1-2 blocks until the criterion is reached or surpassed. For others with higher scores, use your own judgment for determining the number of blocks of practice to put in a set. Individuals will vary in the number of blocks of practice needed, but for most participants it will be best to practice a few blocks at a time and allow the participant to see their progress. In general, it is better to have many sets, each composed of a few blocks than to have a few sets each composed of many blocks.

When the participant's progress slows (for example 3 to 4 blocks with no improvement in processing speed on the IDENTIFY option), advise the participant to look for the small difference between the two targets (e.g. When the vehicle is shown for such a short time, it is hard to tell whether you are seeing a car or a truck. Remember that the car has two windows and that the truck has one window. By keeping your attention directed to this top, window area of the vehicle and looking for this difference, you may be able to identify the vehicle better when it is presented at very fast speeds.).

If, or when, this strategy fails to help, you may try advancing to a more difficult center tasks, or to divided attention training. Often while progressing through Task 2 training, periodically returning to Task 1 training will reveal that the participant has improved the speed at which s/he can perform after practicing the more complex divided attention task. This advancement to training on Task 2 can also break the monotony and deter frustrations of training continuously on Task 1, while also allowing further training progress to be made.

### **Accessing the Software**

Select the Processing Speed button on the Main Training Menu. The next screen permits a choice of center task (e.g., Present/Absent, Identify, or Same/Different) as described above. The default is the Identify task. In addition, the number of blocks of practice and the opportunity for warm-up practice are available from this screen.

### **Divided Attention Training**

## Overview

Selection of this option leads to practice on the divided attention portion (center target and peripheral target localization in the absence of distractors). Each training block for this task is limited to one display duration between 50 and 450 ms, in multiples of 50 ms, and to one eccentricity [inner (Ring 1), middle (Ring 2) or outer (Ring 3)] for the peripheral target. There are 16 presentations or trials within each training block and the datum generated from a training block is the number of trials in which both the central target is correct and the peripheral target is located correctly. It should be recalled from screening that participants must correctly respond to the center target in order to receive credit for peripheral target localization. Participants may tend to enhance peripheral target localization at the expense of central target performance. Trainers should remind participants to give priority to center target discrimination.

## Task Mastery Criteria

Training should continue on Task 2 until the participant can correctly locate at least 75% (or 12 out of 16) of the peripheral targets within a block when the peripheral target is located at the furthest eccentricity (Ring 3) and the display is presented at the fastest speed (50 ms). Of course, center task errors should be minimized.

## Beginning Training

The table below indicates the duration at which training should start based upon the participant's screening threshold for this task. If the participant performs toward the faster end of the range begin with the target in the outer ring; toward the slower end of the range, begin at the inner ring.

Screening Threshold	Duration to Start Training
$\leq 40$	no training
$> 40$ but $\leq 100$	100
$>100$ but $\leq 150$	150
$>150$ but $\leq 200$	200
$>200$ but $\leq 250$	250
$>250$ but $\leq 300$	300
$>300$ but $\leq 350$	350
$>350$ but $\leq 400$	400
$>400$ but $\leq 450$	450
$>450$	500

## General Training Strategy

Since it is desired that all individuals be successful on the initial training blocks, all training

should start at the above specified duration. The general criterion for changing the stimulus conditions is two successive blocks with >11 correct trials. For 0-5 correct trials back up to an easier condition. For 6-10 correct trials provide more practice with the same stimulus parameters. When the participant achieves success on this first stimulus configuration, move the target out to the next ring for the next block(s) of trials, but maintain the same presentation speed. Continue to practice on this combination until the participant achieves the criteria outlined above. Next move the target to the next ring (if there is one) and practice to criteria. When the participant reaches criteria on the outer ring for this stimulus combination, decrease the stimulus duration by 50 ms, move the peripheral target to the inner ring, and repeat the process above. This pattern of training (working from the inner ring to the outer ring at progressively faster presentation speeds) should continue until the participant either masters the overall task (see Task Mastery Criteria above) or experiences difficulty and consistently localizes fewer than 8 peripheral targets. In the latter case, see the section below on strategies for slow progress.

### **Difficulty with Initial Training Block**

If the participant is unsuccessful (0-5 correct) on the initial training block, increase the duration of the next training block by 100 ms. If the participant is still unsuccessful (scores 0-5), increase the display duration again by 100 ms. If the participant is borderline (6-10 correct) on the initial training block, then the initial estimate of threshold is correct and you should continue with the same stimulus specifications and follow the General Training Strategy outlined above. If the participant is very successful (11+ correct) at this duration, decrease the speed for the next block of trials by 50 ms and follow the strategy outlined above under General Training Strategy.

### **Subsequent Training Sessions**

After the initial training session, it is recommended that each subsequent training session begin with a review of the previous session's last successful (score > 10) block of training. This is recommended for a couple of reasons. Again, it is preferable that the participant start off the session with some level of success. Also, the participant may not be able to begin at the level s/he was performing at the last training session. If unsuccessful, the search for the duration and eccentricity at which to begin the training must be made.

If the participant is unsuccessful (scores 0-5) on the review training block, 1) increase the duration of the next training block by 50 ms, or 2) move the target's location inward. If the participant is borderline (scores 6-7) on the review training block, present another block of trials with the same, initial specifications. If the participant is very successful (scores 11+) at this duration, specify this speed for the next block of trials but move the target location to the next outermost ring. Finally, if increasing the display duration by 50 ms does not lead to successful performance, then increase the display duration again by 50 ms and repeat the process just described.

### **Strategies for Slow Progress**

Training may advance quickly in the beginning, but a plateau will usually be reached where the participant feels like progress is not being made. When a participant reaches a level of training that proves difficult (consistently scoring < 8 correct for 6 blocks or more), the following course of remediation is recommended. You may use any or all of the following methods to aid the participant's progress.

The basic strategy to overcome the plateau is to make the task easier for a brief period of time. This may be accomplished by either leaving the target at the same eccentricity and slowing the display speed by 50 ms or by leaving the display speed at its current level and bringing the peripheral target to a less demanding eccentricity. When the participant consistently scores 8+ correct on two blocks of trials, return the stimulus conditions to the original level of difficulty. Alternation between adjusting speed and target eccentricity will usually help people over the plateau.

A second strategy that may be useful in helping individuals to overcome the plateau is a kind of contrast strategy. Instead of continuing to present targets at or near the participant's plateau level, present several blocks of trials at an extremely rapid display duration (e.g. 50 ms) with the target at the closest eccentricity.

The participant may not be able to perform the task at this fast stimulus combination, but a subsequent return to the stimulus conditions of the plateau may make the previously difficult display appear to be slower to the participant.

A third strategy is to limit the part of the visual field in which peripheral targets will be presented. The software has an option that allows the trainer to limit the area of presentation of peripheral targets to either the upper, lower, right, or left half of the visual field. An analysis of the training output often reveals that participants perform more accurately in some parts of the visual field than others. Sometimes when the participant is stuck on the plateau it is useful to present the peripheral targets in the hemi-field where the participant has had success. This may be done without the participant's knowledge of the restricted presentation area and may enhance the participant's belief in their ability to master the task. Alternatively, with the participant's knowledge, it may be useful to restrict the peripheral targets to the hemi-field where the participant's performance is poorest. Sometimes participants are aware of their deficiencies and are motivated to work on the weaker side of the attentional/visual field. All of the above strategies, either singly or in combination, have worked with different participants in the past. Sometimes the selection of the best strategy is merely trial and error. However, it is often the case that many blocks of training will be necessary at one or more of these types of adjustments/alternations in order to help alleviate the participant's frustrations.

## **Accessing the Software**

Select the Divided Attention button on the Main Training Menu. The next screen permits a choice of characteristics for the display. In addition to the previously described choices of number of training blocks and the warm-up practice option, these choices may be grouped into

two categories: characteristics of the central task and characteristics of the peripheral target.

#### Central Task Characteristics

As with the Processing Speed task, there are three choices for the central task. These choices, from least to most difficult, are Present/Absent, Identify, and Same/Different.

#### Peripheral Target Characteristics

**Color:** Generally the white peripheral target is sufficiently salient. However, it is possible to increase or decrease the saliency of the target by altering its color. Bright colors (e.g., yellow, green) may make the target stand out more against the black background than darker colors (e.g., red, blue).

**Target Type:** The default peripheral target is the car. It is possible to use the truck as the peripheral target although this choice does not affect peripheral target detection performance relative to detection of the car.

**Field:** This option permits training on only one half of the target field. Choices are limited to the upper, lower, right or left half of the target field.

## **Selective Attention Training**

### **Overview**

Selection of this option leads to practice on the selective attention portion (center target and peripheral target localization in the presence of distractors).

Each training block for this task is limited to one display duration between 40 and 400 ms, in multiples of 40 ms, and to one eccentricity [inner (Ring 1), middle (Ring 2) or outer (Ring 3)] for the peripheral target. There are 16 presentations or trials within each training block and the datum generated from a training block is the number of trials in which both the central target is correct and the peripheral target is located correctly. It should be recalled from screening that participants must correctly identify the center target in order to receive credit for peripheral target localization. Participants may tend to enhance peripheral target localization at the expense of central target performance. Trainers should remind participants to give priority to center target discrimination.

### **Task Mastery Criteria**

Training should continue on Task 3 until the participant can correctly locate at least 50% (8 out of 16) of the peripheral targets within a block when the peripheral target is located at the furthest eccentricity (Ring 3) and the display is presented for a duration of 100 ms. Of course, center task errors should be minimized.

### **Beginning Training**

The table below indicates the duration at which training should start based on the participant's screening threshold for this task. If the participant performs toward the faster end of the range

begin with the target in the outer ring; if toward the slower end of the range, begin at the inner ring.

Screening Threshold	Duration to Start Training
$\leq 80$	no training
$>80$ but $\leq 100$	100
$>100$ but $\leq 150$	150
$>150$ but $\leq 200$	200
$>200$ but $\leq 250$	250
$>250$ but $\leq 300$	300
$>300$ but $\leq 350$	350
$>350$ but $\leq 400$	400
$>400$ but $\leq 450$	450
$>450$	500

## Training

The strategies used for training on Task 3 are the same as those used for training on Task 2. These guidelines for training can be found in the Divided Attention Training section above. In cases where the participant has extreme difficulty locating the peripheral target in clutter, two additional options are available to the trainer. In order to make the peripheral target more salient, you may either make the distractors dim relative to the target, or you may make the target a different color than the distractors, or you may do both. These options should be used infrequently, because when training is resumed on the normal stimulus arrangement, it may seem more difficult. We have used dim distractors and colored targets, for example, when the participant seems to think that there is no peripheral target among the clutter. In other words, this option is helpful for convincing the participant that there is something there.

## Accessing the Software

Select the Selective Attention button on the Main Training Menu. The next screen permits a choice of characteristics for the display. In addition to the previously described choices of number of training blocks and the warm-up practice option, these choices may be grouped into three categories: characteristics of the central task, characteristics of the peripheral target, and characteristics of the distractors.

### Central Task Characteristics

As with the Processing Speed task, there are three choices for the central task. These choices, from least to most difficult, are Present/Absent, Identify, and Same/Different.

### Peripheral Target Characteristics

**Color:** Generally the white peripheral target is sufficiently salient. However, it is possible to increase or decrease the saliency of the target by altering its color. Bright colors

(e.g., yellow, green) may make the target stand out more against the black background than darker colors (e.g., red, blue).

**Target Type:** The default peripheral target is the car. It is possible to use the truck as the peripheral target although this choice does not affect peripheral target detection performance relative to detection of the car.

**Field:** This option permits training on only one half of the target field. Choices are limited to the upper, lower, right or left half of the target field.

Distractor Characteristics

**Distractor Intensity:** The brightness of the distractors relative to a white target may be diminished by selecting the Dim distractor option. Only two choices are possible: Dim and Normal.

### **Interpreting Training Results for Task 2 and Task 3**

Successful training will be partly due to an observant trainer. When time is spent observing a participant, the trainer is often able to notice response patterns that the participant develops. For example, some participants will respond that the peripheral target was located in only one location throughout a block of trials, or touch spokes in only one-half of the test field. If such patterns are found, strategies suggested in the Divided Attention Training section may help overcome these response patterns.