

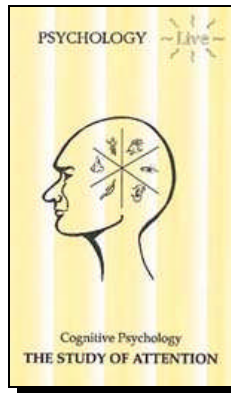
**PSYCHOLOGY**



**SERIES**

**USER'S GUIDE**

**Cognitive Psychology  
THE STUDY OF ATTENTION**



This Guide is designed to be read before viewing and an overview of the content and structure of the programme is given to assist with planning and lesson preparation. It is written to support the teaching of psychology and will be particularly helpful for those new to this subject. The DVD includes a menu linking to sections within the programme. The default setting is to play the DVD through automatically. To select a section highlight the relevant heading using the arrows on your remote control and press 'ENTER'. The chosen section will then play through and return to the menu for your next choice.

**Running time: 42 minutes (1996)**

**The programme content is under copyright law and may not be duplicated in any form without written permission from Uniview Worldwide Ltd.**

Any graphics reproduced in the User's Guides may be photocopied for use with students.

**We hope you find this programme a useful teaching tool.**

## Introduction

Very few teaching aids are used exactly and entirely as their authors intend. The skill of the teacher or lecturer lies in their utilisation of resources to meet the needs of their students. So it is probably best for you to see the programme all the way through and then adapt it to suit your own purposes.

However, the notes that follow are intended to assist in this process and will probably be most useful to less experienced teachers and lecturers. They may be reproduced for teaching purposes only. The film, unlike regular television programmes, is not designed to be watched all the way through in one sitting. It should be used interactively with frequent breaks for discussion or note taking, or other consolidation of learning activity, and for practical demonstrations. There are four formal demonstrations built in, and scope for at least one more.

The pace at which you use the programme will depend on the time available and the level at which your students are studying. For many students new to this topic, or new to cognitive psychology, the 42 minutes of the tape will be too much too soon, and so simply showing the programme as an introduction will be confusing and demoralizing.

Not all of the material included will be relevant if you are following a particular syllabus or prescribed course of study. For more advanced students the film could be useful revision of the basics but the content will need to be supplemented with more advanced material.

## Attention is a good place to begin the study of Cognitive Psychology

- It is historically a good starting point, firstly because attention was extensively studied in the early years of psychological research (before the behaviourist ice-age as some would say) by James, Titchener, Pillsbury and others. The methodological problems which led to its demise could be discussed.
- Secondly, attention pioneered the return of cognition to psychology with the work of Cherry, Broadbent and others.
- It introduces the idea of the information processing approach.
- It acts as a precursor to the study of perception, memory and thought. In terms of a flow of information, attention can be seen as coming after sensation but before the other cognitive topics.

## **Aims of the Programme**

To present the development of the models and theories of attention using relevant examples and to critically evaluate the research to date.

To answer the following questions:

- 1. How is it that we focus our attention or selectively attend, to one input or stimulus and ignore the rest?**
- 2. How is it that some activities seem not to require conscious attention, so that we can do them apparently automatically?**

## **Psychology Syllabus Links**

AQA (A) AS Unit 1

AQA (A) A2 Mod 4 13.3 (a) Selective Attention (b) Divided Attention; 14.3 Approaches (a) Cognitive

AQA (B) AS Mod 2 11.5.2 Key Approaches - Cognitive

AQA (B) A2 Mod 2 11.5.2 Attention; Mod 5 14.1 Cognitive Perspective

Edexcel AS Unit 1 Cognitive Psychology – information-processing

Edexcel A2 Unit 6 Cognitive Approach

OCR AS Core Studies 2541 Approaches

OCR A2 Unit 2548 5.5.5 (h) Attention and Imagery in Sport

**Timing and Content of the Programme**

	<p><b>Introduction</b>                  Can we pay attention to everything?                  Do we <i>have</i> to pay attention to everything?</p> <p>03.00 <b>Take a Break</b> to test your sensory awareness (pause)                  Two major questions arise that will be answered in this programme:                  1. How is it that we focus our attention, or selectively attend, to one input or stimulus and ignore the rest?                  2. How is it that some activities seem not to require conscious attention, so that we can do them apparently automatically?                  The development of attention research including Wundt, World War 2, air traffic control.                  The importance of operator-machine interface eg aircraft controls, car dashboard design.</p> <p>07.00 <b>Selective Attention</b>                  Broadbent's research on dichotic listening.                  Dichotic Listening Practical - reporting dichotically presented sets of digits in two response schedules.                  Stop the tape and follow full instructions below.                  Broadbent's Single Channel Filter Model.                  Evaluation and alternative theories ie Cherry and the Cocktail Party Effect.                  Gray and Wedderburn's research.                  Speech shadowing research.</p> <p>15.00 <b>Modifications of Broadbent's Model</b>                  Triesman – attenuation and dictionary analysis.                  Deutsch and Deutsch - Late Selection Model.                  Evaluation of the single channel approach.</p> <p>19.00 Summary and evaluation of models</p> <p>21.00 <b>Divided Attention</b>                  Allport (Multi-channel theory), Shaffer. Carrying out two tasks at the same time eg audio-typing, driving while talking.                  Automatic performance eg driving on 'auto pilot'.                  Changing automatic skills acquired.                  Interference of automatic processing in task – Healey (1975) counting.  <b>Activity</b> Count the letter 't' in this sentence. Most people get this wrong and an explanation of why follows.</p>
--	--

29.00	Shriffirin and Schneider's distinction between automatic and attentional processes. Kahneman's Capacity Theory.
31.00	<b>Visual Attention</b> Neisser – visual search research. Three practicals follow. Stop the programme if you wish to carry them out at this point. (See full details below).
32.30	<b>Visual Search Study 1</b> - detecting targets against similar and dissimilar backgrounds. Discussion of results and explanation.
34.30	Triesman and Gelade's research. <b>Visual Search Study 2</b> – detecting single-feature targets and combined-feature targets against differing sized backgrounds. Discussion of results and explanation.
38.00	Automatic processing in reading. <b>The Stroop Effect Study</b> – identifying ink colours in distracting and non-distracting words.  <b>Summary</b> Conclusions about the information processing approach in cognitive psychology.

## Notes for Practical and Activities

### Testing Sensory Awareness Activity 03.00

You are cued to stop the programme while students consider if they can attend to all sensory input at once (you may need to remind them what proprioceptive feedback is).

To enhance this activity use a range of stimuli that ensure that as many senses as possible are tested. For example:

- reading;
- listening;
- identifying a felt object;
- the flavours of different jelly beans;
- different smells;
- tracing a word on the palm of the hand held behind the back.

Discussion could cover the extent to which some tasks are carried out automatically and whether we can partially attend to two stimuli by rapidly switching attention. Broadbent thought that we could switch attention up to twice a second and some students may admit to talking with their friends on the telephone while continuing to watch a television programme. Is this detectable by the person at the other end of the telephone line?

Other discussion points may emerge and activities such as driving cars, riding bikes, swimming, dancing and typing may be mentioned - most of which are illustrated in the film. A good discussion at this point will familiarise students with some of the issues to be raised and arouse their interest and attention. Confident students who are convinced that they can listen to different inputs in each ear will get a shock in the next practical when they find that they probably cannot.

### Selective Attention Practical 09.00

#### **Dichotic listening: reporting dichotically presented sets of digits in two response schedules (after Broadbent's split span research 1954)**

You will be cued to stop the programme and run the practical. If you prefer it can be replaced with an explanation and discussion or with a demonstration. To run the practical you will need a dichotic listening audio file. This can be produced in-house or there is material available at [www.uniview.co.uk](http://www.uniview.co.uk)

The aim here is to demonstrate the difficulty of trying to attend to two stimuli simultaneously in the same modality and also to replicate a classic piece of research which led Broadbent to his selective attention model. The description follows in the programme.

#### **Hypothesis**

*More correct six digit sequences will be recalled using the ear-by-ear technique than by using the pair-by-pair technique.*

This is explained in the next passage of the programme which introduces the model of selective attention that Broadbent based on this and other research. You may wish to show this passage to your students and then pause later to discuss the model in relation to your students' experience with the practical. Essentially we cannot listen to both ears at once so we attend to one ear which we can easily recall and hope to pick up traces of the message in the unattended ear from sensory memory.

## Method

If you are prepared to abandon the highest experimental standards, students can work in pairs, in threes or even in fours with the participant role rotating. However careful instructions will be needed to avoid confusion and the task itself is very difficult indeed for most people even under ideal conditions. In fact many of your students will probably fail to recall any sequences of digits correctly at all, so it is a good idea to reassure them of this and tell them that their failure in no sense offers a final judgment on their cognitive capacities.

## Procedure

Three digits are played to the participant's left ear through stereo headphones while three different digits are played to their right ear simultaneously.

eg	(left ear)		(right ear)
	7		4
	9		6
	1		2

The task is to correctly recall all the digits according to one of two response schedules.

### 1. Pair-by-pair (order of presentation)

In this the first pair of digits must be recalled before the second pair, which must be recalled before the third pair. It does not matter if the left ear is recalled before the right or vice versa as long as the pairs are correctly sequenced.

eg 74 96 12 correct.  
47 69 12 correct.  
74 69 21 correct.  
79 46 21 not correct.

### 2. Ear-by-ear recall

All the digits in one ear must be recalled before all the digits in the other ear. As long as this is achieved it does not matter if the order of presentation is muddled.

eg 791 462 correct  
246 197 correct  
472 961 not correct

Note that in either case all the digits must be recalled for the sequence to be scored as correct, so encourage your participants to guess the last digit - they may guess correctly as it fades from sensory memory.

## Results

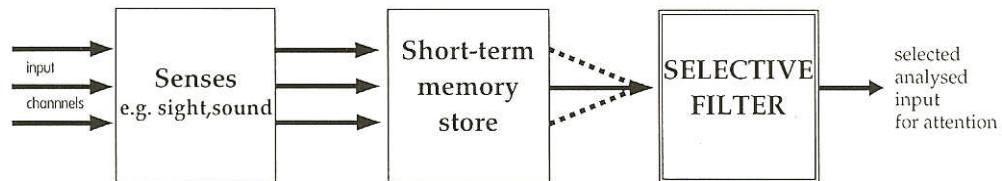
You may find that students successfully recalling in the pair-by-pair mode will explain how they did it in a way which shows that they first attended to the data in an ear-by-ear manner and then re-organised it into a pair-by-pair response. It is therefore valuable to supplement your quantitative data with subjective reports from participants (qualitative material).

## Analysis

In running the study both independent and related designs are possible. A repeated design gives students the opportunity to attempt both conditions, though make sure that you counterbalance by having some start in each response schedule. Analysis for statistical significance can be carried out with the Wilcoxon Signed Ranks test for a related design or the Mann-Whitney U test for an independent design. Alternatively t-tests may be used if your data meets the requirements of a parametric test. Good luck! (If students are struggling with these statistical tests it might be worth using [Number Cruncher CD-ROM](#) to help).

Students will probably need to have a clear understanding of Broadbent's model and how he arrived at it before proceeding to consider whether his model is correct.

### BROADBENT'S FILTER MODEL



**Some of the key points made in the programme to this point:**

1. Practical problems forced researchers to try to predict and understand internal mental processes such as attention.
2. The information processing approach seeks to model the flow of information through the mind. More information reaches sense receptors than can be processed for meaning or understood. Studying and modeling attention helps us to understand how some information is selected for processing and how and when processing is carried out automatically.
3. Broadbent proposed a single channel filter model to explain selective attention. Only one channel can be attended to at a time. Information from unattended channels is filtered out and its meaning is not analysed or processed or understood in any way. You will be aware only of basic physical characteristics of unattended information ie whether a voice is high pitched or low pitched but not the meaning of what the voice is saying.
4. The model has no basis in neuro-anatomy. There is no connection between models of cognitive processes (mind) and the brain.

**The Cocktail Party Effect Discussion**

This is probably self evident though students need to understand how it cannot be explained by the Broadbent model. Students may be helped by, and may enjoy, giving anecdotal examples of this themselves and relating their own experience to single-channel theory.

**Gray and Wedderburn Discussion**

The presenter asks viewers to think for a moment about the implications of Gray and Wedderburn's research. Stop the programme at the point where the question is posed and encourage students to answer it. The answer given is that information seems to reach the listener from an unattended channel because it has meaning for the listener. Along with the Cocktail Party Effect this seems to imply that some meaning is understood without conscious attention - contrary to Broadbent's model.

## The Speech Shadowing Demonstration

This technique can make an interesting demonstration for students. It allows an experimental approximation of the Cocktail Party Effect because it requires the participant to give their full attention to the material to be shadowed which is played through stereo headphones into one ear. You can then note what, if any, material played into the unattended ear will reach conscious attention. Your students should be told that really good shadowing performance is very difficult even without interference from the unattended ear.

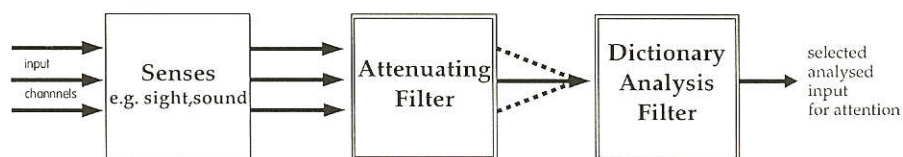
To carry out the demonstration you will need a special shadow audio file. This can be produced in-house or there is material available at [www.uniview.co.uk](http://www.uniview.co.uk) The first message could be an easy to follow prose passage (eg a descriptive piece from a novel) of several minutes length. The second message should start after about twenty seconds of the prose passage. These other messages may vary the gender of the speaker, the meaningfulness of the message (varying from nonsense through to messages of personal significance to the participant), the language used or even repeat the prose being shadowed. Have printed copies of the first passage available and note when the person shadowing makes most shadowing mistakes and if and when any material from the unattended channel is understood.

Alternative exercise - if you haven't got the technical equipment available, you can - as shown in the film - ask a student to ring through to the room with instructions (eg directions, procedures for fire drill, a recipe) which the person on the phone has to relate as s/he is hearing it.

## Understanding the Models

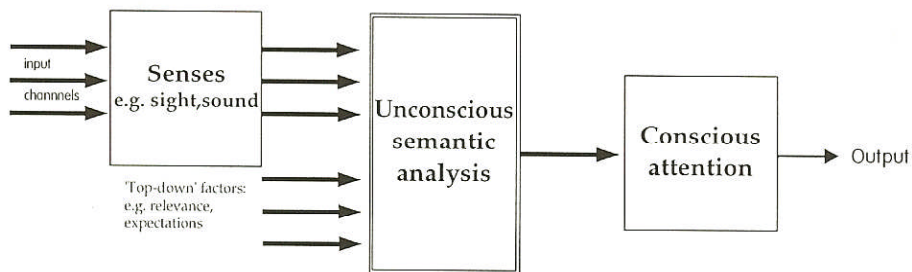
Treisman's **attenuation model** modifies Broadbent's model by introducing a second, attenuating filter and a dictionary analysis unit. At the risk of complexity she seeks to overcome the limitations of Broadbent's original model, though some would argue that the mechanisms she introduces are not fully explained. You may wish to encourage your students to understand in detail exactly **how it can explain the Cocktail Party Effect** as this is passed through fairly quickly on the video.

TREISMAN'S ATTENUATION MODEL



Similarly the **late selection model** (Deutsch & Deutsch), so called because selection for conscious attention comes late after sensory input has been analysed for meaning unconsciously, rather than early as in Broadbent's model. You may wish to test your students' understanding of both modified models and get them to explain which they prefer and why.

LATE SELECTION MODEL. (Deutsch & Deutsch)



## Automatic Processing

An old and well-known example of how difficult it is to modify automatic skilled performance comes from the Victorian fairground. A bicycle would be modified so that the steering was reversed. In other words if you steered left the bicycle turned right and vice versa. Someone who had not previously ridden a bike would be trained to ride this machine only and would of course make it look easy. In principle it is no more difficult than learning to ride a conventional bike. Punters would then be invited to pay a small sum of money to try to ride the bicycle a short distance to win a large prize. The task was almost impossible though because once you have learned to automatically co-ordinate your movements to ride a conventional bicycle it is just about impossible to override this automatic performance in the short term. The rider would always fall off and lose his money to the amusement of onlookers.

## Activity - counting the letter T

[Thelma talked to the students as she reached for the terrapin in the tank.](#)

This sentence appears on the screen twice and you may wish to pause the tape each time to give students ample time to first count how many times the letter T occurs and then to allow them to recount when the sentence reappears.

## Visual Search Practical 1 (after Neisser 1963) 32.30

The **aim** here is to see if participants will be able to scan a list of letters and identify a target which is similar to the background letters as quickly as they are able to scan a list of letters which are dissimilar to the target letter.

**The hypothesis is that visual search for dissimilar letters will be quicker than for similar letters.**

### Method

Create about 10-12 lists of letters each containing a target, once only, which is named in the list title (see examples below). Participants are asked to search several lists to control for familiarity and expectancy effects but the data is taken only from **two matched lists**.

The targets are variously located through the lists but **one set of lists is matched so that in one list of rounded letters (dissimilar) the angular target (eg T) is in the same position as another in a list of angular letters (similar)**. Thus the mean number of letters that must be searched through in the test lists for both similar and dissimilar conditions is identical.

Participants should be instructed to look down the lists as quickly as possible from left to right without missing any letters and without going back, and asked to call out as soon as they find the target. The lists should ideally have at least a 20 letter sequence. The ones below are 30 x 30. Using a stopwatch you can record search times and calculate mean search times per letter for similar and dissimilar letters. The students could be asked to explain why vowels are not used. (They may make readable words so may be a confounding variable).

List 1  
Target letter T

RDBQD GBCQPGRSJQGS RDGPBRQSCPBQP  
GBDJCBPGPSGRGSQRPOBSJCPDGQCBPS  
PGRQBCPGDQRSGCDBPBJSQPDCBJGSQR  
GBSJPRQDQBGBGQPSJJPQBCSRPQJBCDSQ  
PBSCGDRPDBCSRQDSRPBCDGPBQGPSBC  
DRDPDQRPSCBJGDPGBCQRDGRJPBCJGDP  
SDBRCBGP RDBQD GBCQPGRSJQGS RDGPB  
RQSCPBQPGBDJCBPGPSGRGSQRPOBSJC  
PDGQCBPSPGRQBCPGDQRSGCDBPBJSQP  
DCBJGSQRGBSJPRQDQBGBGQPSJJPQBCSR  
PQJBCDSQP PBSCGDRPDBCSRQDSRPBCDG  
PBQGPSBCDRDPDQRPSCBJGDPGBCQRDG  
RJPBCJGDPSJJPQBCSRPQJBCDSQP PBSCGD  
RPDBCSRQDSRPBCDGPBQGPSBCDRDPDQ  
RPSCBJGDPGBCQRDGRJPBCJGDPSDBRC  
BGP RDBQD GBCQPGRSJQGS RDGPBRQSCP  
BQPGBDJCBPGPSGRGSQRPBSJCPDGQCB  
PSPGRQBCPGDQRSGCDBPBJSQPDCBJGS  
QRGBSJPRQDQBGBGQPSJJPQBCSRPQJBCD  
SQPBSCGDRPDBCSRGD SRPBCDGPBQGPS  
BCDRDPDQRPSCBJGDPGBCQRDGJRQSRP  
QCBGJDBPSPGRQBCPGDQRSGCDBPBJSQ  
PDCBJGSQRGBSJPRQDQBGBTQPSJJPQBCS  
RPQJBCDSQP PBSCGDRPDBCSRQDSRPBCD  
GPBQGPSBCDRDPDQRPSCBJGDPGBCQRD  
GJRQSRPQCBGJDPBSGPCSGBPDQCDRGP  
RDSBSCQTDGRSBC R PGBSCJQRBPBSGPC  
SGBP DQCDRGP RDSBSCQTDGRSBCRPGBS  
CJQR BDRQPBSRPGDBCSQBRPGJBCDSQD  
QPJBDGDPBDQRGPCBJPDGQRGJPBQDBPG

List 2 Target letter T
N L N V Y W L F H K Z M Y W N X V M L H W L Y F N Z L M X F H Y W F H L Z N V M X L H F W F K M Z F K F L N F W M X W Y F Z N L K Z Y F H W M L N F Y L N K M V X W Z K H F X V H K L K F W Y L K M Z N X Y W F H K N M H F L W Y Z N X F Y K H W L F H K L T X V M W Z G H F L M K N Z V X W Y H X Y W Y L M F V Y W X L M K F V K M F H M K X W Z L M W Z L H F Y V N Z W K L M N A F Z W X F H K L M F Y V F X W F Z N F M L H W X Y K N L H W X H Z F N L M K Y H W X F Z V Y N K L W F Z M W X F H L N K Y W Z N K F Y L W Z N V H F K M V F Y L X W V Z L T X V M W Z G H F L M K N Z V X W Y H X Y W Y L M F V Y W X L M K F V K M F H M K X W Z L M W Z L H F Y V N Z W K L M N A F Z W X F H K L M F Y V F X W F Z N F M L H W X Y K N L H W X H Z F N L M K Y H W X F Z V Y N K L W F Z M W X F H L N K Y W Z N K F Y L W Z N V H F K M V F Y L X W V Z L Z L H F Y V N Z W K L M N A F Z W X F H K L M F Y V F X W F Z N F M L H W X Y K N L H W X H Z F N L M K Y H W X F Z V Y N K L W F Z M W X F H L N K Y W Z N K F Y L W Z N V H F K M V F Y L X W V Z L W Z L M W Z L H F Y V N Z W K L M N A F Z W X F H K L M F Y V F X W F Z N F M L H W X Y K N L H W X H Z F N L M K Y H W X F Z V Y N K L W F Z M W X F H L N K Y W Z N K F Y L W Z N V H F K M V F Y L X W V Z L Z L H F Y V N Z W K L M N A F Z W X F H K L M F Y V F X W F Z N F M L H W X Y K N L H W X H Z F N L M K Y H W X F Z V Y N K M T F Z M W X F H L N K Y W Z N K F Y L W Z N V H F K M Y W N X V M L H W L Y F N Z L M X F H Y W F H L Z N V M X L H F W F K M Z F K F L N F W M X W Y F Z N L K Z Y F H W M L N F Y L N K M V X W Z K H F X V H K L K F W Y L K M Z N X Y W F H K N M H F L W Y Z N X K X W Z L M W Z L H F Y V N Z W K L M N A F Z W X F H K L M F Y V F X W F Z N F M L H W X Y K N L H W X H Z F N L M K Y H W X F Z V Y N K L W F Z N V L K Y H F K W F N L M H K Z X F

A related design may be used with order of testing counterbalanced and order of presentation of each list within the condition randomized.

## Results and Analysis

Results may be displayed using box plots, or similar such as bar charts, and statistical significance calculated using a related t-test if parametric requirements are met.

Neisser found that visual search for dissimilar letters was quicker than for similar letters and concluded that we do not actually attend to the background letters in the lists as *letters*. We simply look for features, for example angular features in a background of rounded features. Where background items are similar to the target, more features must be considered and this is why it takes longer. Thus Neisser concluded that there is a pre-attentive stage of visual processing which allows us to detect a target without having to consciously attend to and decode each background item.

## Visual Search Practical 2 (after Treisman and Gelade 1980) 34.30

The **aim** is to see if search times differ as a function of the number of background items under two conditions.

**The hypothesis is that in condition two, search times will increase markedly as a function of the number of background items to be scanned, but in condition one the increase in search time will be smaller or non-existent.**

### Method

In the first condition the target is either of one feature or the other eg a black letter or Y. Participants are asked to scan visual arrays of 20, 70, 120, 170 and 220 items from top left across each row until they identify either of the two target items.

In condition two the background items remain the same but the target is the conjunction of the two features together ie a black letter Y.

It is important that the participants start at the top left and search systematically across each row.

**Lists** – examples of two matched lists are given below with arrays of 220 items. They can be enlarged and separated for use with non-matched lists.

### Analysis

Treisman and Gelade plotted their results visually to show how search times increased in condition two but not in condition one. Students at an introductory level could be encouraged to visually display the data and draw conclusions from it. For a more sophisticated level of analysis you may wish to consult the original research report.

The effect is one in which in the first condition either target simply pops up into attention in the same way as in the previous Neisser study, whereas in the second condition you really have to look quite hard to detect the target. This is surprising because superficially both conditions are quite similar. The backgrounds are identical and in both conditions the target is defined by two features. The difference is that **in one case the target can be either of two features but in the other case the features are combined.**

The explanation for the effect is that in the single feature condition both features can be searched for in parallel more or less automatically. You are simply looking for features in the same way as in the previous Neisser visual search study and the same pre-attentive mechanism allows for rapid identification.

In the second condition simple feature detection is of little value - in effect you have to identify an object rather than detect features. Each item must be recognised one after the other in series and this requires focused attention. We cannot simply scan the visual array and wait for our automatic processing ability to simply 'pop up' the target.

<p>List 1 Target a black letter or the letter T</p> <pre> X X XX X X X XX XX X XX XX X XX X XX XX XX X XXX X XX XX X X X XX X X X XXXX X XXX X X X X X XXX XX X X X X XX X XX XX XX X X XX XX X X X X X X X X XX X XX X XX X XX X X X X X X X X X X X XX XXX X XX XX X X X X X XX X XX XX XX X X X X X X X XX X X X XX XX X X X X X X Y XX X X NX X X XX XXX X X X XXXX X XX X XX XX XXX X X                 </pre>
---

List 2 Target a black letter T
X X XX X X X XX XX X XX XX X XX X XX XX XX X XXX X XX XX X X X XX X X X XXXX X XXX X X X X X XXX XX X X X X XX X XX XX X X XX XX X X X X X X X XX X XX X XX X X X X X X X X X X X X X XX XXX X XX XX X X X X XX X XX XX XX X X X XXX XX XX X X X XX XX X X X X X X Y XX X X TX X X XX XXX X X X XXXX X XX X XX XX XXX X X

### Stroop Effect Practical

This can be used as an interesting class activity or as a piece of coursework.

The **aim** in this familiar and reliable practical is to see if participants are able to name ink colours at the same speed under different conditions.

### Method

There are several variations possible – each participant could take part in each condition; three different groups of participants could do one condition; just conditions two and three could be tested.

The necessary materials are easy to produce (see examples on page 18 or see Gross 2005 p 227) and students can easily time each other to produce data.

Note that the Stroop Test can be purchased on a CD-ROM from [www.uniview.co.uk](http://www.uniview.co.uk)

## The Stroop Task

RED  
BLACK  
YELLOW  
BLUE  
GREEN  
BLACK  
YELLOW  
GREEN  
RED  
BLUE

BED  
SLACK  
FELLOW  
CLUE  
DREAM  
SLACK  
FELLOW  
DREAM  
BED  
CLUE

In **condition one** the participant is presented with blocks of coloured ink printed on paper and their task is to call out the names of the colours from top to bottom as fast as possible.

In **condition two** the same colours are used but are printed as words.

In **condition three** the same colours are again used but are printed as words which are the names of colours - but not the same colours as the ink the words are printed in.

## Results and analysis

The time taken to name the ink colours in the first two conditions is likely to be fairly similar but in the third condition markedly slower. This is a reliable effect and it is difficult to overcome it. Percentages and a bar chart can be presented. The results from just two conditions could be used in a statistical analysis.

## Discussion

So what is happening to make the naming of the ink colours in the third condition so difficult? Having experienced the effect it would be interesting to set students the task of explaining it in terms of automatic and attentional processing.

The point here is that once again we cannot switch off automatic processing and in this case it seems to interfere with the task we are trying to do - naming ink colours. We seem to automatically process the words in condition three for meaning, in other words decode them / read them / understand them and this knowledge of their meaning interferes with the task of decoding the meaning of the ink colours - in other words naming the colours.

However, if the word meanings in condition three interfere with the task of naming the colours, why is the effect not found in condition two where words are also used?

Ask your students to consider where else in the programme we have talked about meaningful material intruding from an unattended source. Where did we first mention this as happening? The answer is the Cocktail Party Effect! We seem to have another manifestation of this Effect in a different modality where meaning reaches conscious attention because it is relevant or relates meaningfully to the task in hand.

The meanings of the words in condition two do not intrude because they are not relevant to the task in hand. But in condition three intrusion does occur, even though we do not want it to, because the meanings of the words are relevant to the task in hand.

## Recent Applications

Although the information approach is now used in all areas of cognitive psychology, the early attention models encouraged research which contributed to many areas of everyday life involving close attention for long periods of time such as flight control, driving, major surgery, manning machinery and monitoring CCTV screens.

More recently, work on **Action Slips** has played a vital role in helping to explain and avert disasters mainly using James Reason's research at Manchester University. Reason has spent most of his life trying to shift the focus from attaching blame to individuals for error in dealing with life or death situations, eg medical and aviation personnel, to examining what goes wrong in systems, management and cultures. The Health Service in the UK are already using his knowledge to help the system that surgeons work under in order to reduce action slips.

The Department of the Environment, Transport and the Regions (DETR) has commissioned a psychological investigation into **Children and Road Safety** in response to the alarmingly high rates of child pedestrian accidents in the UK - the highest in Europe. The Report at the end of Phase 1 (1999), based on five empirical projects, looked at the basic abilities and fundamental skills required and used by young children for safe road-crossing. One project in particular (Foot et al, 1999) showed that poor road-crossing performance of young children can be attributed to insufficient skills and understanding in terms of targeting their attention appropriately. Dunbar et al (1999) found that attention switching especially in younger children was poor. As a result, in Phase 2 (2002) training programmes are now being more effectively designed and targeted based on sound understanding of children's attentional abilities.

Research into **ADHD** has developed drugs, most notably Ritalin, which is successful in many cases. Other contributions have been the applied use of behaviour modification and research on nutritional issues. In the past, children who don't pay attention in class have been seen as disinterested and disengaged. However, research on **gaze aversion** has found that primary school children look away when they are thinking of an answer to a question, remembering information and thinking about speaking, just as adults do (Doherty-Sneddon, 2004). Gaze patterns could be a useful cue for teachers and parents to assess the child's attention levels and readiness to learn. Findings have also shown gaze aversion in response to difficult questions is something which develops with age rather than being an innate behavioural response to questions (Doherty-Sneddon et al, 2002).

- Doherty-Sneddon, G. (2004) *Don't look now ... I'm trying to think* The Psychologist 17, 82-85
- Reason, J. (1987) *The Chernobyl Errors* Bulletin of The British Psychological Society, 40, 201-206
- Reason, J. (1990) *Human Error* Cambridge University Press
- Reason, J. (2005) *Absentmindedness/Risk Management – Radio interview with Norman Swan* The Health Report ABC National Radio  
<http://www.abc.net.au/rn/healthreport/stories/2005/1529677.htm>

An adaptation of the Stroop Task is being used by clinical psychologists, in particular with those suffering from depression or anxiety. The emotional Stroop procedure helps to determine whether individuals have a bias towards attending to and processing depression-relevant or anxiety-relevant information – a factor which may maintain their anxious state.

Mogg et al (1993) presented participants with individual words in coloured ink, some related to anxiety or depression, eg **DEATH** or neutral words such as **CARPET**, and recorded their reaction times. This and many other studies have indicated that those suffering from anxiety have an attentional bias towards anxiety-relevant words. Mogg et al (2000) suggest that this happens before the person becomes consciously aware of the meaning of the word. They have also found this effect with anxiety-relevant faces. Work in paediatric anxiety-depression (eg Ladouceur et al, 2005) has shown that children and adolescents diagnosed with affective disorders process information differently to those in the 'normal' control group. Current research is continuing on the etiology and maintenance of emotional disorders.

- Ladouceur, C.D., Dahl, R.E., Williamson, D.E., Birmaher, B., Ryan, N.D. & Casey, B.J. (2005) *Altered emotional processing in pediatric anxiety, depression and comorbid anxiety-depression* Journal of Abnormal Child Psychology, Vol 33 (2), p 165
- Mogg, K., Bradley, R.B., Williams, R. & Mathews, A. (1993) *Subliminal processing of emotional information in anxiety and depression* Journal of Abnormal Psychology, Vol 102, p 304-11
- Mogg, K., Millar, N. & Bradley, B.P. (2000) *Biases in eye movements to threatening facial expressions in generalized anxiety disorder and depressive disorder* Journal of Abnormal Psychology, Vol 109 (4), p 695-704

## Current Research

**Expert Systems**, ie software which integrates human experts' knowledge, is an active area of research, most noticeably in the medical arena. For example, GUESSING (the wonderful acronym for Glasgow University Expert Systems in Nursing Group) is a system which has used the knowledge built up over years by clinically excellent nurses in certain areas of care, such as predicting bed sore occurrence. This is part of a small beginning to what could be an enormous task but which would be widely useful. For example, if the knowledge and experience of expert engineers could be integrated into an expert system there could be real implications for predicting machine failure, stress on buildings and much more.

Work on **ADHD** is investigating whether the reason is chronic over-arousal (switching attention constantly) or under-arousal (the inability to maintain attention). Hopefully there will be further developments in the research into the effect of different food on children's concentration in general.

New ESRC project research in **gaze aversion** is investigating whether looking away when questioned results in more accurate answers in children. If gaze aversion does have a functional benefit it will have important educational implications. This ESRC project is also investigating whether the benefit, if any, is cognitive or social (less embarrassment or self-consciousness if looking away).

The study of **absentmindedness** is predicted to continue apace thanks to James Reason's work on action slips and will save lives in the 21<sup>st</sup> century.

### Websites

[www.uniview.co.uk](http://www.uniview.co.uk)

a large collection of psychology videos, DVDs, posters, brain jellies, X-psyting extras, etc worth checking regularly for latest news

[www.theatp.org](http://www.theatp.org)

the home of the Association for the Teaching of Psychology  
invaluable access to information and advice for teachers of psychology in UK and Europe

[www.bps.org.uk](http://www.bps.org.uk)

the home of The British Psychological Society  
free downloads of recent articles from The Psychologist magazine

[www.apa.org](http://www.apa.org)

the home of the American Psychological Association  
nothing free on this site!

[www.psychology.heacademy.ac.uk](http://www.psychology.heacademy.ac.uk)

details of psychology events, resources and research  
lists all UK university psychology departments; BPS list of accredited undergraduate courses

[www.s-cool.co.uk](http://www.s-cool.co.uk)

revision site for students on a limited number of topics; club-like feeling with an s-magazine giving advice on bank accounts, interview skills and even how to shave! Teachers World with generic information

<http://www.mrmind.com/mrmind3>

turning the Turing Test upside down, MRMIND challenges you to take the Blurring Test and prove to him(?) that you are human - make your case to a robot of your choice  
take the Human Quotient test - great fun and time-waster!

[www.youramazingbrain.org.uk](http://www.youramazingbrain.org.uk)

just go and enjoy – the brain in great detail, packed with information, activities

[www.holah.karoo.net](http://www.holah.karoo.net)

information, fun activities, links – excellent for staff and students alike

<http://psyonline.edgehill.ac.uk>

A Level resource from Edgehill College for AQA. Good and reliable resource for students and teachers. Includes a countdown to Mod 4 exams to the nearest second!

<http://psyberfun.users.btopenworld.com/>

too new to comment on but looks promisingly weird, wacky and addictive!

<http://en.wikipedia.org/wiki/Psychology>

extraordinary free encyclopedia which anyone can edit anytime even without being online! Over 1 million entries with definitions and further information

<http://www.brainconnection.com/>

an award-winning site (USA) with lots of relevant material and some excellent animated mini-demonstrations.

*Uniview Worldwide Ltd accepts no responsibility for the content of any external websites.  
Please let us know if you experience any problems with any of these links.*

## References for Film Script and Guide Update

- Allport, D.A. (1980) *Attention and Performance* in Claxton, G. (Ed) *Cognitive Psychology: New Directions* London Routledge & Kegan Paul
- Allport, D.A., Antonis, B. & Reynolds P (1972) *On the division of attention: a disproof of the single channel hypothesis* Quarterly Journal of Experimental Psychology, 24, 225-235
- Broadbent, Donald (1954) *The role of auditory localization in attention and memory span* Journal of Experimental Psychology, 47, 191-196
- Broadbent, Donald (1958) *Perception and Communication* Oxford: Pergamon
- Cardwell, M., Clark, L. & Meldrum, C. *Psychology for A Level* London Harper Collins
- Cherry, E.C. (1953) *Some experiments on the recognition of speech, with one and two ears* Journal of the Acoustical Society of America, 25, 975-979
- Deutsch, J.A. and Deutsch, D. (1963) *Attention: some theoretical considerations* Psychological Review, 70, 80-90
- Eysenck, Michael W. (1997a) *Doing Two Things at Once* Psychology Review 4(1) pp 10-12
- Gray, J.A. and Wedderburn, A.A. (1960) *Grouping strategies with simultaneous stimuli* Quarterly Journal of Experimental Psychology, 12, 180-184
- Gross, Richard (2005) *Psychology The Science of Mind and Behaviour 5<sup>th</sup> Ed.* Hodder Arnold
- Gross, R. (2003) *Themes, Issues and Debates in Psychology 2<sup>nd</sup> Ed.* Hodder Arnold

- Hayes, N. (1994) *Foundations of Psychology* London Routledge
- Healey, A.F. (1976) *Detection errors in the word THE; evidence for reading units larger than letters* Journal of Experimental Psychology; Human Perception and Performance, 2, 235-42
- James, W. (1890) *The Principles of Psychology Vol 1* New York: Henry Holt
- Kahneman, D. (1973) *Attention and Effort* Englewood Cliffs, NJ: Prentice-Hall
- Neisser, U. (1963) *Decision-time without reaction time: experiments in visual scanning* American Journal of Psychology, 76, 374-85
- Shaffer, L.H. (1975) *Multiple attention in continuous verbal tasks* in Rabbit, P.M.A. & Dornic, S. (Eds) *Attention and Performance* London: Academic Press
- Shriffrin, R.M. and Schneider, W. (1977) *Controlled and automatic human information processing: 11 Perceptual learning, automatic attending and a general theory* Psychological Review, 84, 127-190
- Stroop, J.R. (1935) *Studies of interference in serial verbal reactions* Journal of Experimental Psychology, 18, 43-62
- Titchener, E.B. (1908) *Lectures on the elementary psychology of feeling and attention* New York
- Treisman, Ann (1960) *Contextual cues in selective listening* Quarterly Journal of Psychology, 12, 242-248
- Treisman, Ann (1964) *Verbal cues, language and meaning in selective attention* American Journal of Psychology, 77, 206-219
- Treisman, A. and Gelade, G. (1980) *A feature integration theory of attention* Cognitive Psychology, 12, 97-136
- Watson, J.B. (1924) *Behaviourism* Chicago: University of Chicago Press

### Further Reading for Students

- Association for the Teaching of Psychology (1992) *Ethics in Psychological research: Guidelines for Students at Pre-degree Level* Leicester ATP available on <http://www.theatp.org/>
- Cardwell, M. (2003) *Complete A-Z Psychology Handbook 3<sup>rd</sup> Ed.* Ideal students' companion throughout A level and undergraduate courses. Very user-friendly, definitions and jargon explained, revision and exam tips, diagrams and worked examples
- Coolican, H. (Lead Author) 1996 *Applied Psychology* London Hodder and Stoughton
- Eysenck, M.W. and Keane, M.T. (1990) *Cognitive Psychology: A students handbook* Hove & London (UK), Hillsdale (USA) Lawrence Erlbaum Associates. Written for undergraduates but ideal extension reading for advanced students
- Gross, R. (2003) *Themes, Issues and Debates in Psychology 2<sup>nd</sup> Ed.* Hodder Arnold
- Griggs, R. A. (2005) *Psychology: A Concise Introduction* Palgrave Macmillan All the main topics in psychology covered, clearly and concisely - American. A companion website <http://bcs.worthpublishers.com/gray/content/psychsim5/launcher.html> is worth looking at for 20 animated activities

### Further Reading for Teachers

- British Psychological Society (Mar 2006) *Code of conduct, Ethical Principles and Guidelines* Leicester BPS available on [http://www.bps.org.uk/document-download-area/document-download\\$.cfm?file\\_uuid=5084A882-1143-DFD0-7E6C-F1938A65C242&ext=pdf](http://www.bps.org.uk/document-download-area/document-download$.cfm?file_uuid=5084A882-1143-DFD0-7E6C-F1938A65C242&ext=pdf)
- Benjafield, J.G. (1992) *Cognition* Englewood Cliffs Prentice-Hall
- Davey, Graham (Ed.) (2004) *Complete Psychology* Hodder Arnold An undergraduate text for first years written by a British team – very comprehensive, plenty of artwork, activity boxes, applications; up to date and user-friendly.
- Norman, D.A. (1976) *Memory & Attention (2nd Ed.)* New York Wiley
- Eysenck, M.W. (1993) *Principles of Cognitive Psychology* Hove & London (UK), Hillsdale (USA) Lawrence Erlbaum Assoc
- Slack, J. (1990) in Roth, I. (Ed.) *Introduction to Psychology Vol 2* Hove & London (UK), Hillsdale (USA) Lawrence Erlbaum Assoc
- Solso, R.L. (1991) *Cognitive Psychology (3<sup>rd</sup> Ed.)* Needham Heights Allyn & Bacon
- Tipper, Steven (2005) *Memories of Attention* *The Psychologist* 18 (6) 362 364 Professor Tipper's Presidents' Award Lecture clearly outlining the links between attention and memory

## Contacts

### The Association for the Teaching of Psychology

The ATP has highly experienced teachers and examiners ready to give advice and assistance, especially for new teachers of this topic. They can recommend textbooks and resources that will get you started.

ATP Helpline: Dorothy Coombs

work: [dorothy@pursglove.ac.uk](mailto:dorothy@pursglove.ac.uk) 01287 280800

home: [dorothycoombs@24whinchat.freemove.co.uk](mailto:dorothycoombs@24whinchat.freemove.co.uk) 01287 636502

New teachers of this topic are well advised to get in touch with the ATP:

The Association for the Teaching of Psychology  
c/o The British Psychological Society  
St Andrew's House  
48 Princess Road East  
Leicester  
LE1 7DR  
<http://www.theatp.org>

Annual Conference - The ATP holds an excellent conference for members each July. As well as lectures and workshops, there is an opportunity to meet the examiners and to browse all the latest books and resources.

### The British Psychological Society

The British Psychological Society  
St Andrews House  
48 Princess Road East  
Leicester  
LE1 7DR  
Tel: 0116 254 9568  
[www.bps.org.uk](http://www.bps.org.uk)

### The American Psychological Association

The American Psychological Association  
750 First Street NE  
Washington DC 20002-4242  
USA  
Tel: 001 202 336 5500  
[www.apa.org](http://www.apa.org)

## Resources

Uniview has a large collection of resources for most areas of psychology, biology and sociology. Go online to see a full list of resources or contact Uniview to request a free copy of their latest catalogue:

Uniview Worldwide Ltd  
PO Box 20  
Hoylake  
Wirral  
CH48 7HY

Tel: 0151 625 3453  
Fax: 0151 625 3707

[www.uniview.co.uk](http://www.uniview.co.uk)  
[sales@uniview.co.uk](mailto:sales@uniview.co.uk)

Other titles available in the Psychology Live Series include:

- ✓ [The Study of Memory](#)
- ✓ [Perception: the theories](#)
- ✓ [Classical and Operant Conditioning](#)
- ✓ [Further Approaches to Learning](#)
- ✓ [Cognitive Development](#)
- ✓ [Language Development](#)
- ✓ [Evolution by Natural Selection](#)
- ✓ [Reductionism](#)
- ✓ [Introduction to Designing Experiments](#)
- ✓ [Organising Quantitative Data](#)
- ✓ [Inferential Statistics](#)
- ✓ [Exploring Qualitative Methods](#)

Also recommended:

[Number Cruncher CD-ROM](#)

All titles are available in VHS and DVD format

New titles are always in development and we welcome suggestions for areas you would like to see included in the Series, as well as any comments you may have about these titles.

Please contact us on [sales@uniview.co.uk](mailto:sales@uniview.co.uk)

No part of this publication may be copied in any way or stored in a retrieval system, except for teaching purposes, without the written permission of Uniview Worldwide Ltd PO Box 20 Hoylake Wirral CH48 7HY  
Tel: 0151 625 3453 Fax: 0151 625 3707

[sales@uniview.co.uk](mailto:sales@uniview.co.uk)    [www.uniview.co.uk](http://www.uniview.co.uk)

