Attention limits and non-associative learning

Supported GRE teaching and original transfer practice

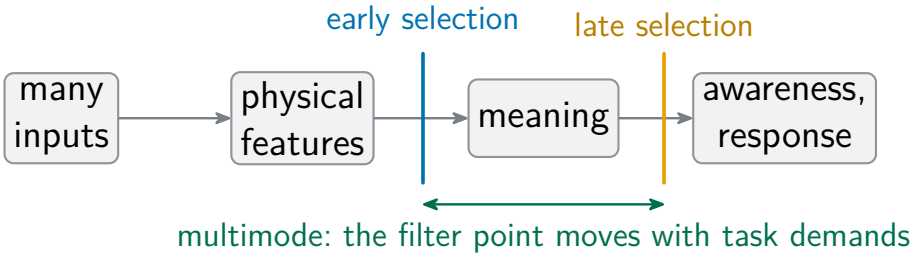
Attention limits and non-associative learning

- Compare early-selection, late-selection and flexible models of **selective attention** 选择性注意.
- Predict the costs of **divided attention** 分配性注意.
- Use load theory to predict when distractors break through.
- Explain **habituation** 习惯化 and **dishabituation** 去习惯化, and use them to test infants.

Where is the filter?

- Early selection (Broadbent, 1958): a filter picks one message by physical features such as ear, pitch or loudness. Meaning is processed only after the filter.
- Attenuation (Treisman, 1964): the unattended message is weakened, not blocked, so important words such as your own name can get through.
- Late selection (Deutsch and Deutsch, 1963): all messages are processed for meaning, and selection happens just before response.
- Multimode theory (Johnston and Heinz, 1978): the filter can move. Selecting later uses more capacity.

Figure: Where is the filter?



- Where the filter sits is what the theories disagree about.
- Match each part of the diagram to the text.

Divided attention

- Two tasks interfere when together they need more central capacity than is available, or when they need the same kind of processing.
- A hands-free phone call still slows a driver's braking (Strayer and Johnston, 2001). The bottleneck is central, not in the hands.
- Practice can make a task automatic, so that it needs less capacity.

Load theory

- High perceptual load in the main task uses up perception, so distractors are not processed.
- High working-memory load weakens control, so distractors break through more.
- The two kinds of load make opposite predictions, so the type of load must be named.

Habituation

- Dishabituation: a changed stimulus restores the response.
- Habituation is not sensory adaptation (the receptors tiring) or fatigue: after habituation the response returns at once to a new stimulus.
- Infant researchers use it: a baby looks less at a repeated picture, and looks longer again if it notices a change. Recovery of looking shows the baby can tell the two apart.
- Extinction is different: it removes a learned association; habituation needs no association.

Worked example: a listening study

- Early selection, with a strict filter, predicts that the name will not be noticed.
- Attenuation predicts that the name sometimes gets through, because important words need little signal. About a third of listeners do notice their name (Moray, 1959).
- Noticing the name therefore argues against a strict early filter.

Worked example: an infant study

- The fall is habituation; the rise is dishabituation.
- It shows the infant can discriminate red from green squares.
- It does not show that the infant has colour words or adult colour concepts. A control is needed to check the green square is not simply brighter.

Figure: Worked example: an infant study

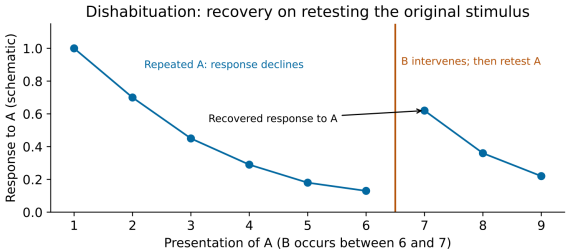


Illustration only; matched controls help rule out recovery due to rest.

- Dishabituation: a different stimulus restores the response to the original one
- Match each part of the diagram to the text.

Common errors

- Calling habituation a form of conditioning.
- Confusing habituation with sensory adaptation or fatigue.
- Saying all dual tasks fail equally; costs depend on load and on what the tasks share.

Common errors (2)

- Treating hands-free phones as safe because the hands are free.
- Using "load" without saying whether it is perceptual or working-memory load.

Key terms

- **selective attention**: Focusing on some information while ignoring the rest.
- **divided attention**: Sharing limited capacity between tasks done at the same time.
- **habituation**: A weakening response to a stimulus that is repeated without consequence.
- **dishabituation**: The return of a habituated response after the stimulus changes.

Check yourself

- A listener notices their name in the unattended ear. Which model does this support over a strict early filter?
- A family stops noticing a clock's ticking, but notices at once when it stops. Name both effects.
- Does high perceptual load in the main task make distraction more or less likely?