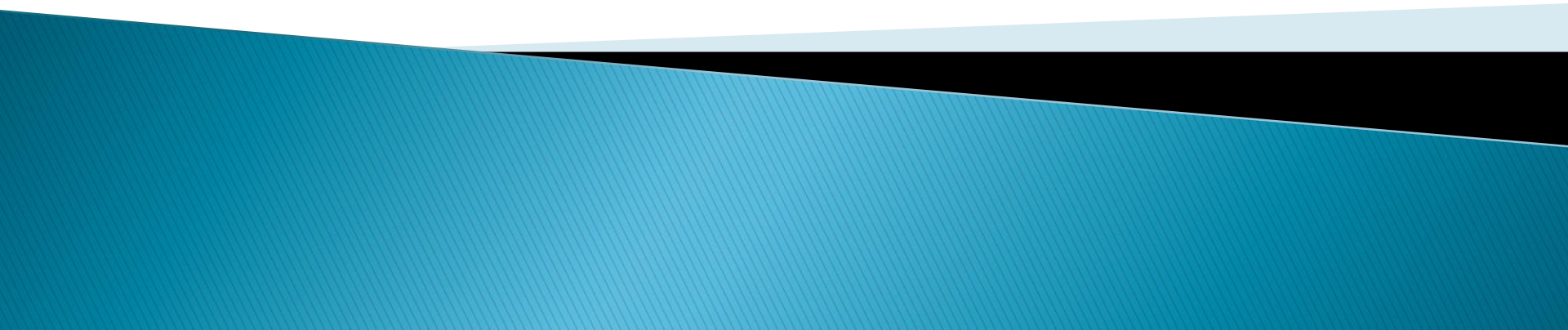


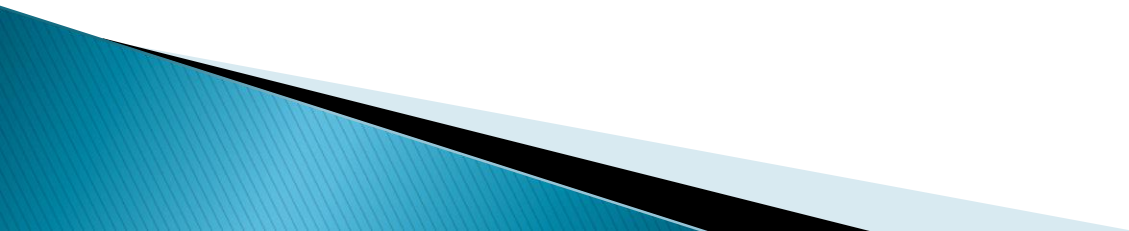
Experimental Psychology

Lecture 9: Case Study: Experimental study of memory

Dr. Kate Williams

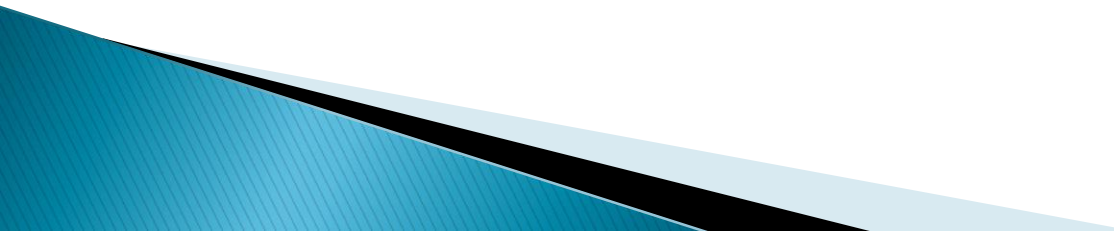


**Would having perfect
memory be a gift or a curse?**



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Adaptive and Necessary mechanism of Forgetting?

- ▶ Difference between conscious and unconscious forgetting.
 - ▶ Does our mind actively remove unwanted, irrelevant or distracting information from conscious awareness?
 - Depends on the type of memory?
 - Experimental research using lab studies to examine both emotional/traumatic memories and everyday/mundane memories.
 - Aim to discover if a difference exists in the mechanisms used.
- 

Basic Research

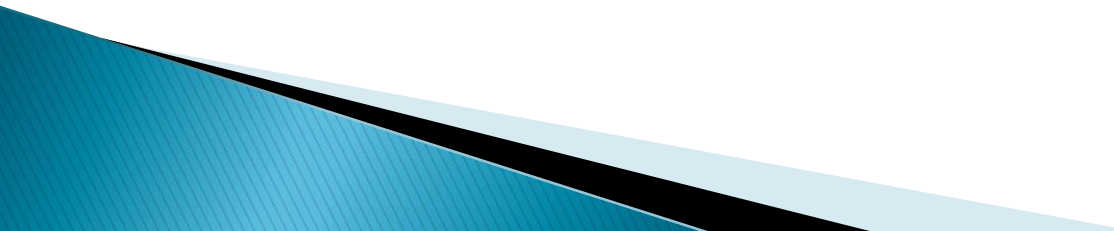
- ▶ Very much theoretical
 - ▶ Conducted for the sake of gaining understanding of how memory works.
 - ▶ Highly controlled experiments performed in the lab.
 - ▶ Only the independent variable(s) are allowed to vary.
 - ▶ Results are interpreted in line with previous theories.
 - ▶ More predictions are made which leads to more experiments.
- 

Applied Research

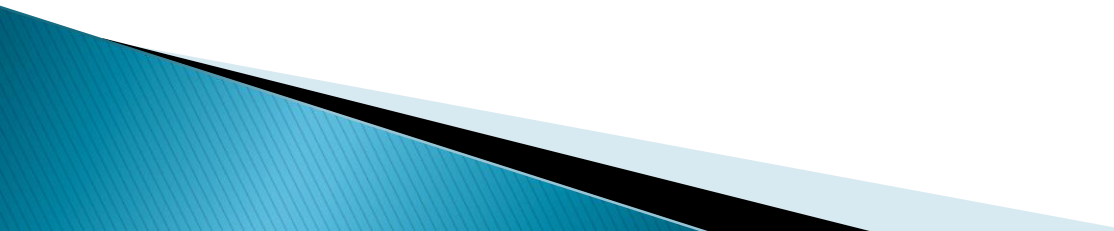
- ▶ Take results from lab studies and see if same results are found in real life situations.
 - ▶ Conducted outside of the lab – field or observational work.
 - ▶ Primarily goal-driven.
 - ▶ Not so much concerned with understanding basic memory processes.
 - ▶ Road test theories in practical situations
- 

Something in the middle?...

▶ **Applied lab work:**

- Looks at everyday memory problems within a lab setting.
 - Uses stricter experimental control than applied field studies but less than basic research.
 - Important because we need to understand the mechanisms that underlie memory whilst being aware that changes or influences from real-life impact on memory processes.
- 

Mechanisms of forgetting

- ▶ Memories enable us to function in a complex social world.
 - ▶ However, because we are continuously bombarded with constantly changing information, our memories need to be regularly updated.
 - ▶ In order to do this we must forget old or currently irrelevant information that may be competing for recollection with new up to date information that we wish to recall.
- 

Mechanisms of forgetting



E.g., when trying to locate where we parked the car at the supermarket, it would be beneficial to forget any other details about the car, such as where we parked it last week and concentrate on trying to remember where we parked it on the current occasion.

Conscious forgetting

► Directed forgetting:

Forget Condition



Study List 1



“Forget” List 1



Study List 2



“Remember” List 2



Memory test

Remember condition



Study List 1



“Remember” List 1



Study List 2



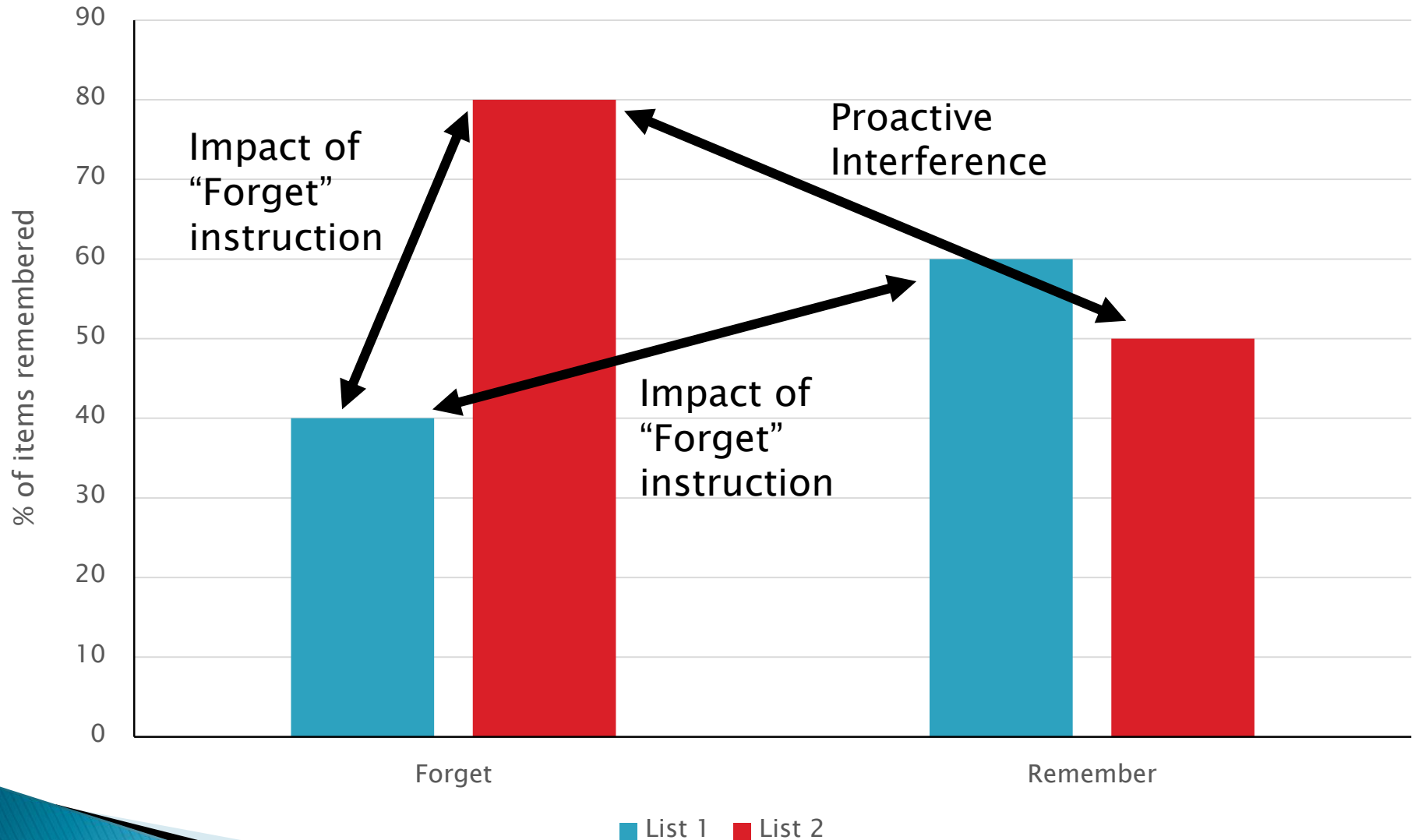
“Remember” List 2



Memory test

What effect does “Forget” List 1 items have on the memory test?

Directed Forgetting: Typical Findings



Directed Forgetting: Continuing Influence

Forget Condition



“Forget” List 1



“Remember” List 2



Word fragment task with
List 1 + 2 items (implicit)



Explicit memory test of
List 2

Remember condition



“Remember” List 1



“Remember” List 2

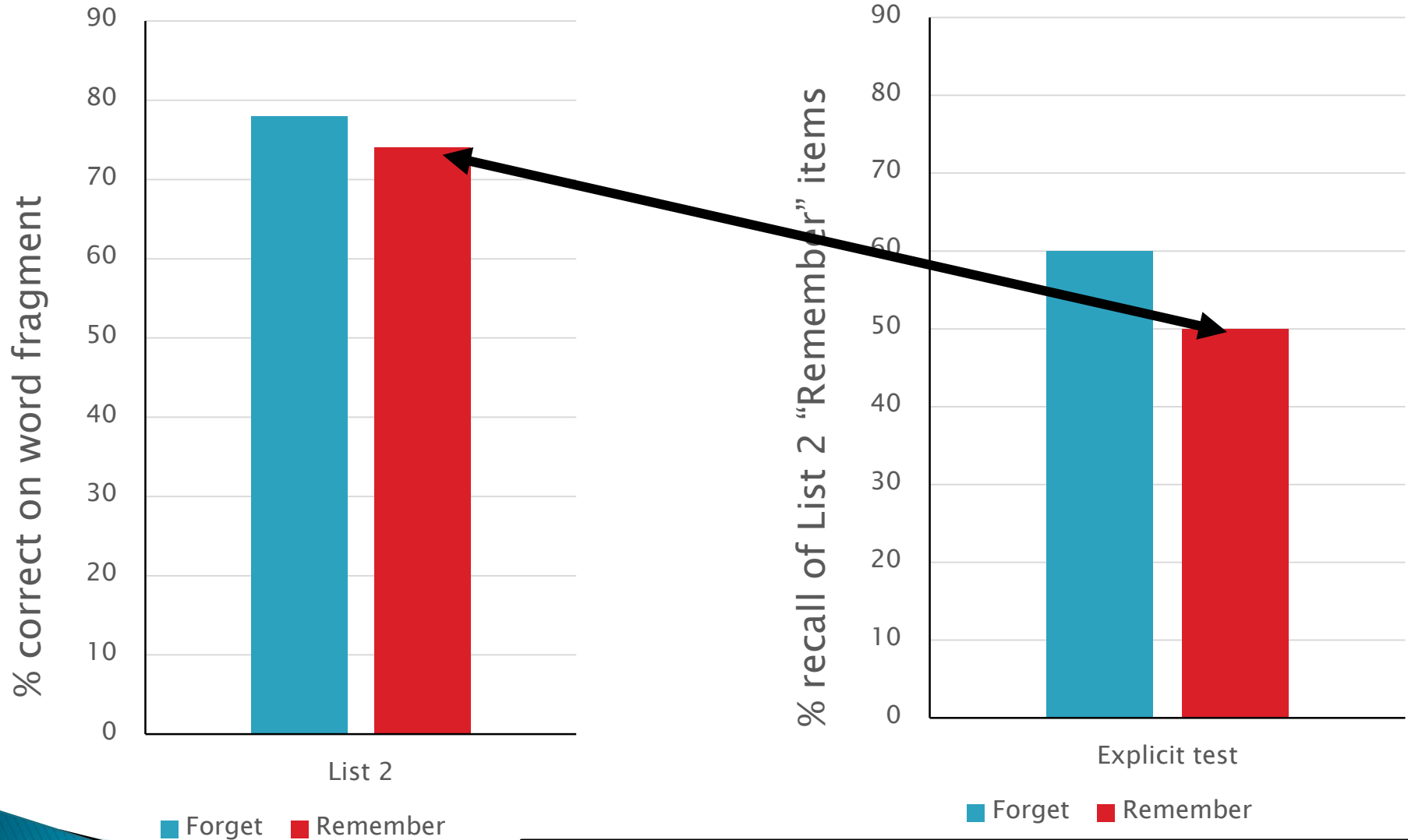


Word fragment task with
List 1 + 2 items (implicit)



Explicit memory test of
List 2

Directed Forgetting: Continuing Influence



Unable to consciously remember words
but can access them unconsciously

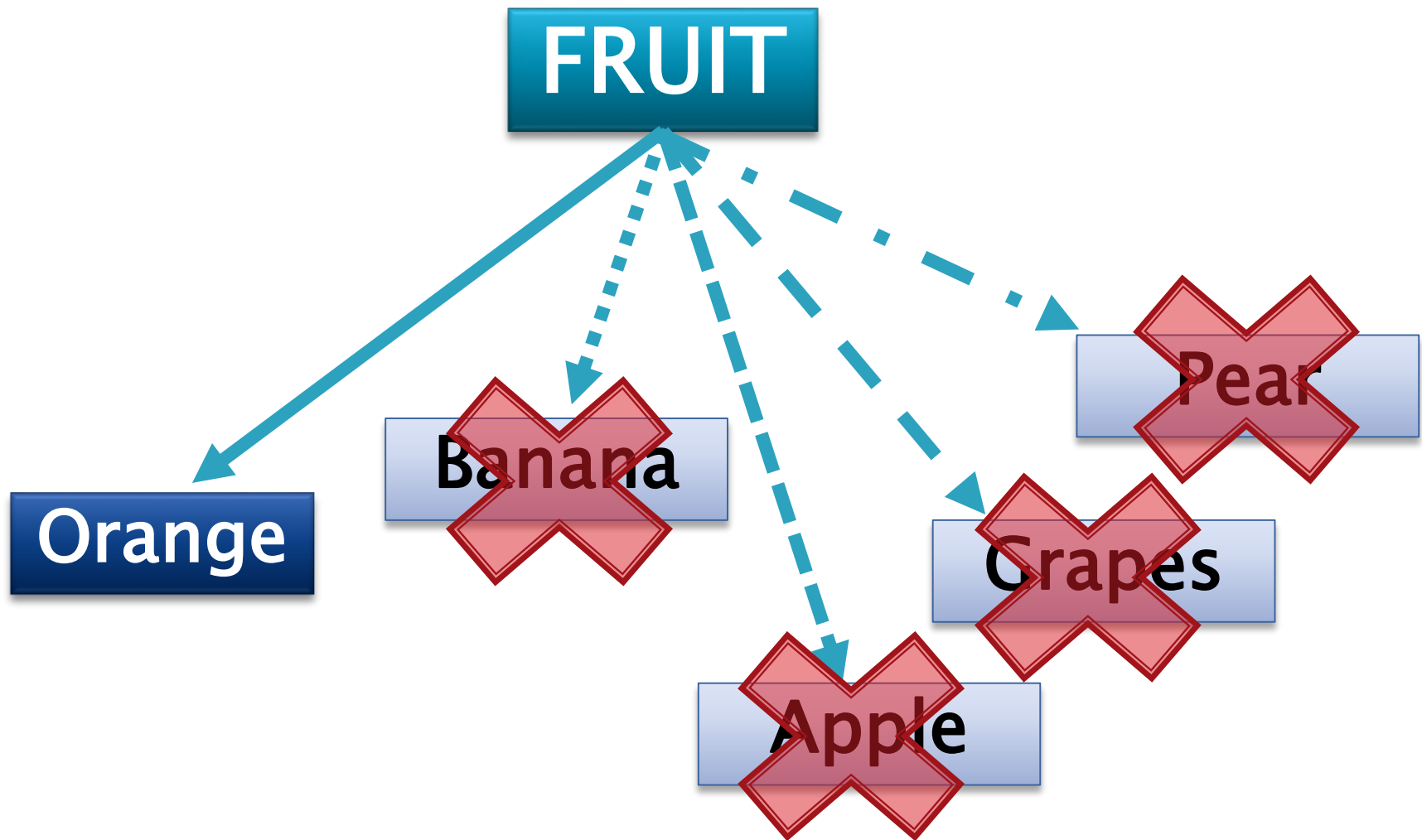
Unconscious Forgetting

▶ Retrieval-induced Forgetting (RIF):

- Retrieving an item from memory (e.g., Orange) from a specific category cue (e.g., *Fruit*), can later impair retrieval of another item sharing the same category (e.g., Pear), but not the retrieval of an item from an unrelated category (e.g., *Vehicle-Car*).
- Happens due to cues for recall being insufficiently specified – general cues activate the target memory (Rp+) in addition to all other memories related to that cue (Rp-).
- Unwanted information competes for retrieval with the target item.
 - These are then forgotten so that the target item can be retrieved.

Anderson, Bjork, & Bjork (1994)

Competition for Retrieval



Anderson, Bjork, & Bjork (1994)

Typical Retrieval–practice paradigm

Study

Fruit_ orange

Vehicle_ car

Fruit_ banana

Vehicle_ train

Fruit_ pear

Vehicle_ bicycle

Fruit_ apple

Vehicle_ airplane

Retrieval
practice

Fruit_ or _____

Fruit_ ba _____

Test

Rp+

Fruit_ or _____

Fruit_ ba _____

Rp–

Fruit_ pe _____

Fruit_ ap _____

Vehicle_ ca _____

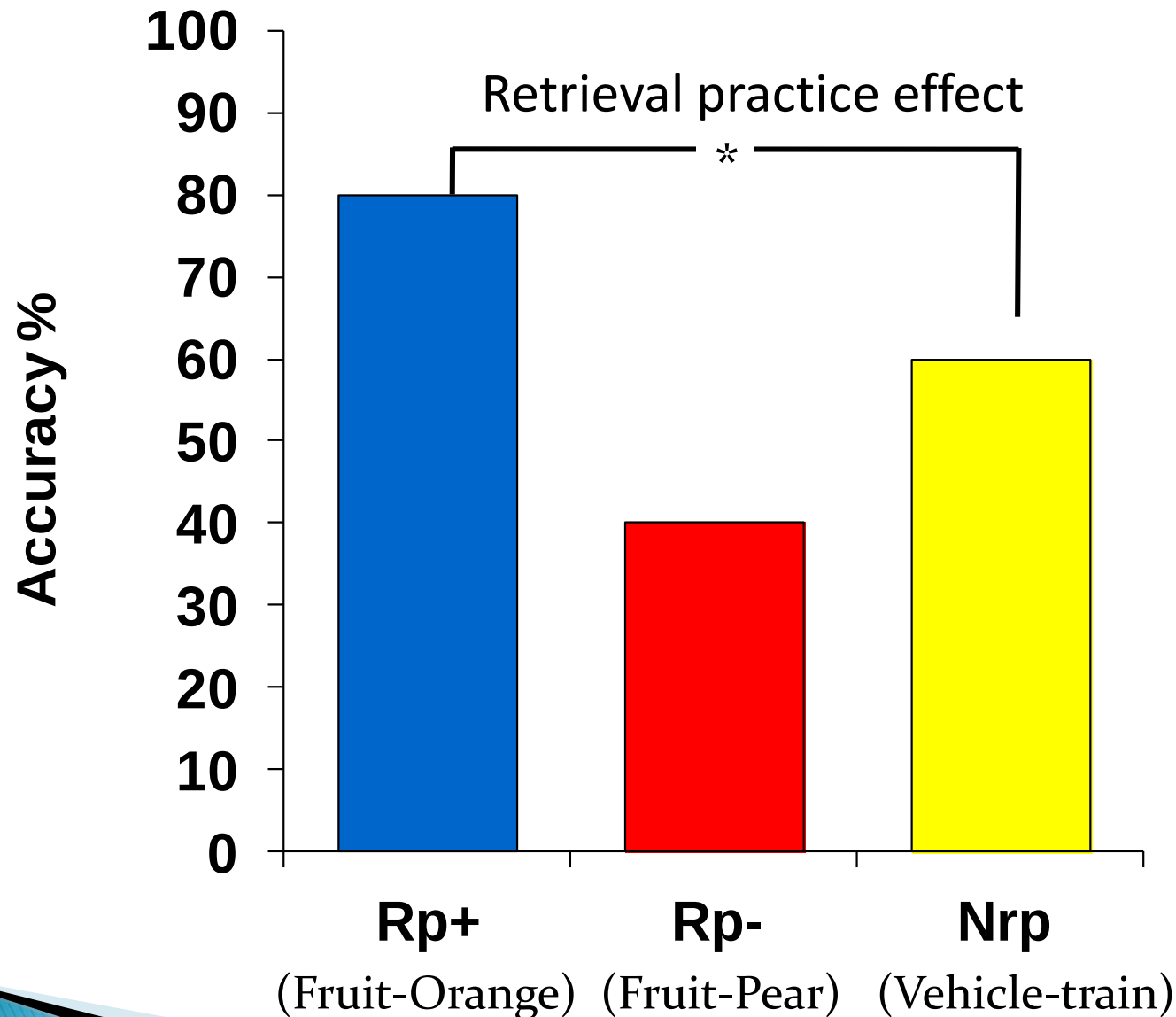
Vehicle_ tr _____

Vehicle_ bi _____

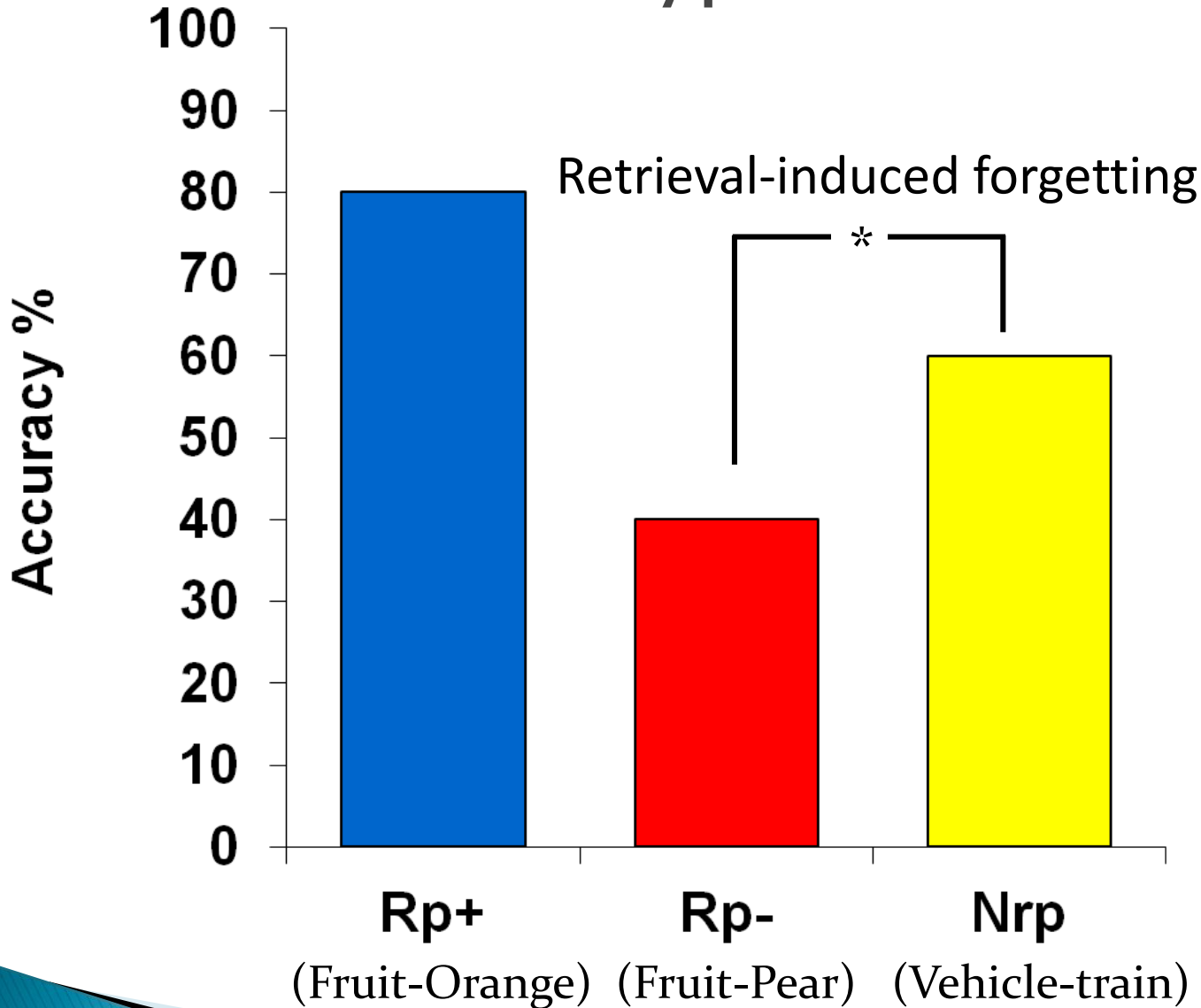
Vehicle_ ai _____

Nrp

RIF: Typical results



RIF: Typical results



This *RIF* effect, reflects the forgetting of 'Pear' as a result of it competing during retrieval of 'Orange' due to their shared semantic category (e.g., Fruit).

- ▶ There are thought to be up to 200 published studies focusing on the prevalence, dynamics, and boundary conditions of RIF (Anderson, 2003; Storm & Levy, 2012, for reviews).
- ▶ Empirical evidence has revealed that RIF emerges with:
 - semantic material (e.g., Anderson, 2003),
 - episodic material (e.g., Racsmany & Conway, 2006),
 - factual information (e.g., Anderson & Bell, 2001),
 - phonological information (e.g., Bajo, et al., 2006),
 - text passages (e.g., Little, Storm & Bjork, 2011),
 - visuo-spatial material (e.g., Ciranni & Shimamura, 1999),
 - arithmetic facts (e.g., Phenix & Campbell, 2004),
 - eyewitness memory (e.g., Saunders & MacLeod, 2002),
 - mental imagery (e.g., Saunders, Fernandez, & Kosnes, 2009),
 - creative problem solving (e.g., Storm, Angello, & Bjork, 2011),
 - autobiographical memory (e.g., Storm & Jobe, 2012),
 - social contexts (e.g., Storm, Bjork, & Bjork, 2005), and
 - actions (e.g., Reppa, Worth, Greville, & Saunders, 2013).

Theoretical accounts of RIF

Inhibitory Theory:

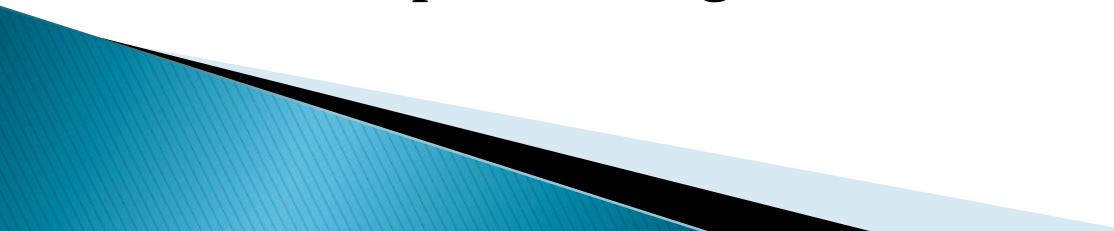
- ▶ Retrieval practice leads to reduced activation of Rp- items.
- ▶ During retrieval practice, Rp- items compete with the Rp+ items, and in order to allow efficient retrieval practice of the target Rp+ items the memory representation of the Rp- items is actively inhibited or suppressed (e.g., Anderson et al., 1994; Anderson & Spellman, 1995).
- ▶ This inhibition of Rp- items is expressed in their lower accuracy in the later test phase, compared with items whose category was never practiced (Nrp items).

Theoretical accounts of RIF

- ▶ **Non-inhibitory Theories:**
- ▶ Do not support the idea that RIF emerges from the inhibition of competing items during practice.
- ▶ Instead, they propose other mechanisms:
 - Associative blocking (Butler, et al., 2001; MacLeod, et al., 2003)
 - Encoding specificity (Perfect, et al., 2004).
- ▶ Suggest that RIF occurs because the memory of practiced items is strengthened by retrieval practice and blocks the retrieval of weaker non-practiced memories.
- ▶ Context-based account (e.g., Jonker, Seli, & MacLeod, 2013)
 - RIF is an entirely contextual effect.
 - It occurs when the context between study and practice changes, and the context of the practice phase is activated during the test phase.

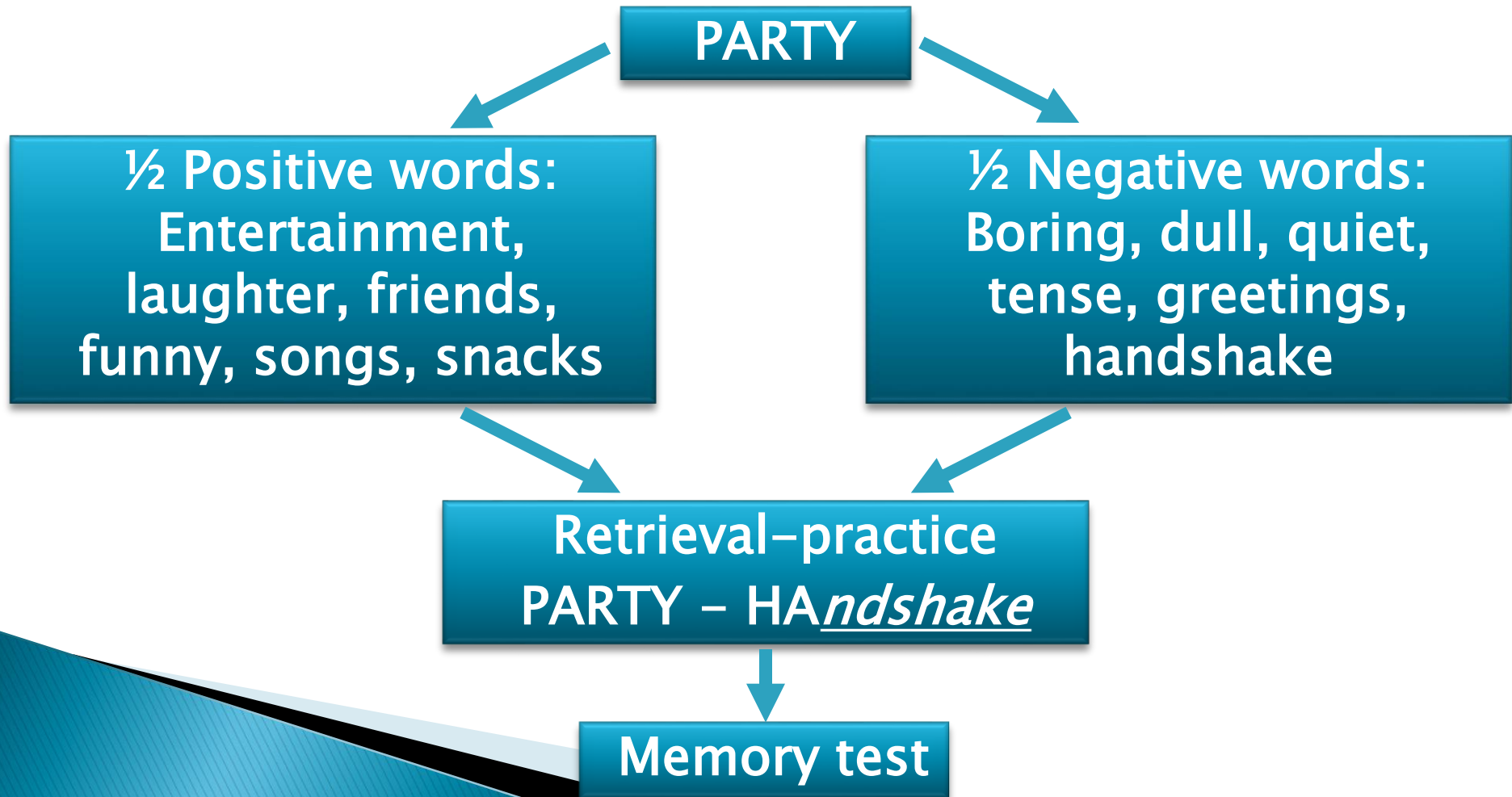
Practical considerations

RIF in Generalised Social phobia disorder: Amir et al. (2001)

- ▶ Intrusive memories of negative social interactions.
 - ▶ Constant retrieval of negative social information prevents socially phobic individuals from forgetting socially negative memories.
 - ▶ Negative social information is highly integrated in memory.
 - ▶ All negative social situations are tightly bound together.
 - ▶ Difficult to forget negative information because retrieval of one cue ends up retrieving others.
- 

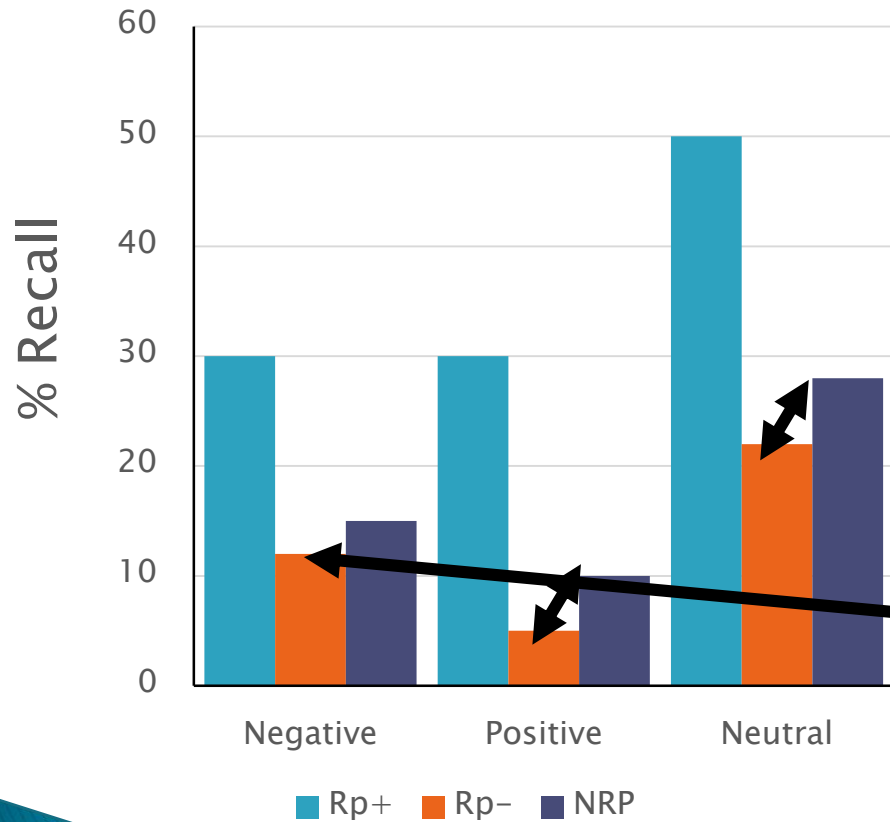
Amir et al. (2001)

- Two groups of Ps: Generalised social phobics & non-anxious controls
- Given 4 neutral and 4 social category's of words – in the social category, words were divided into positive and negative.

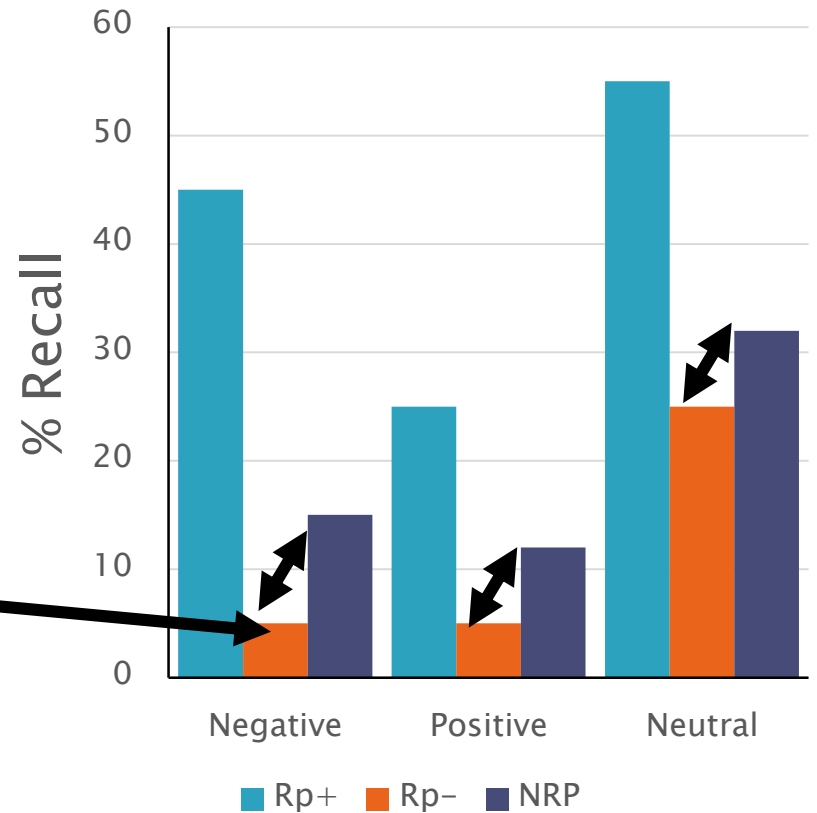


Amir et al. (2001)

Generalised Social Phobics

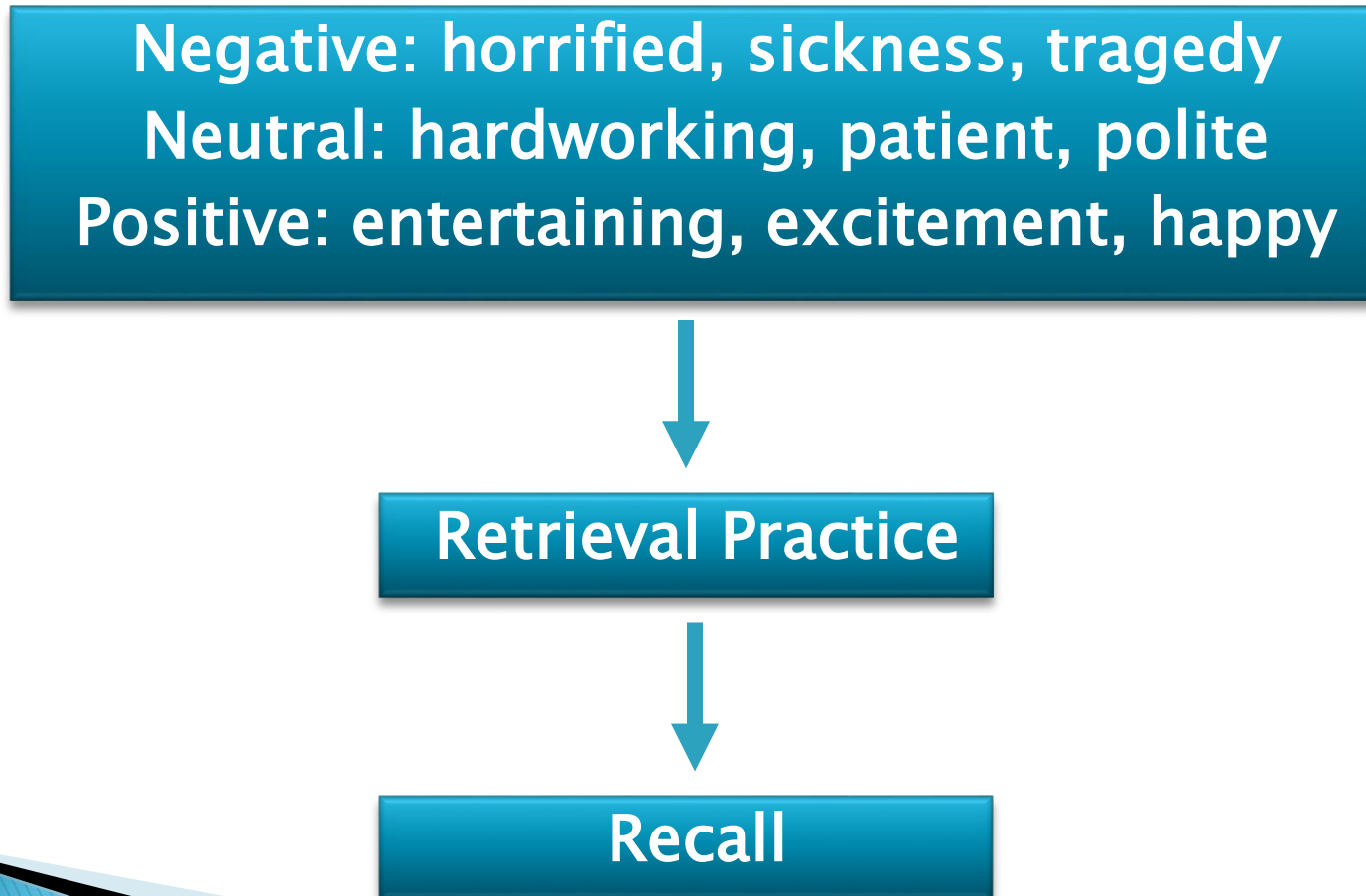


Non-anxious controls

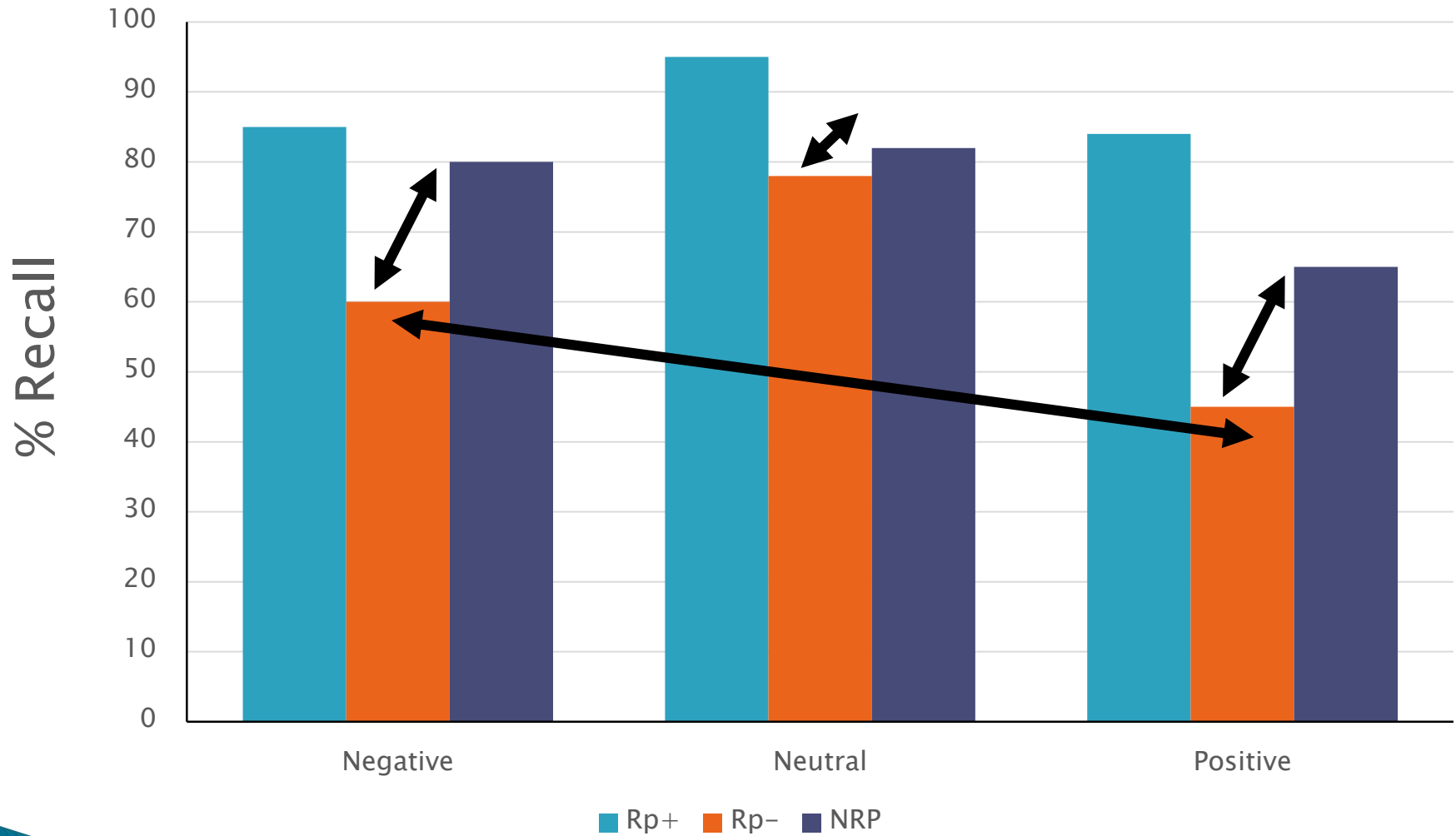


Practical Considerations

- ▶ Unconscious forgetting in emotional memory:
- ▶ **Barnier et al. (2004)**



Barnier et al. (2004)



Practical Considerations

- ▶ Potential impact on memory from Eyewitness Testimony
 - The effects of repeated questioning: Shaw et al. (1995)

Someone's wallet has been stolen from student halls
Police called and Ps view slides:
8 sweatshirts / 8 textbooks



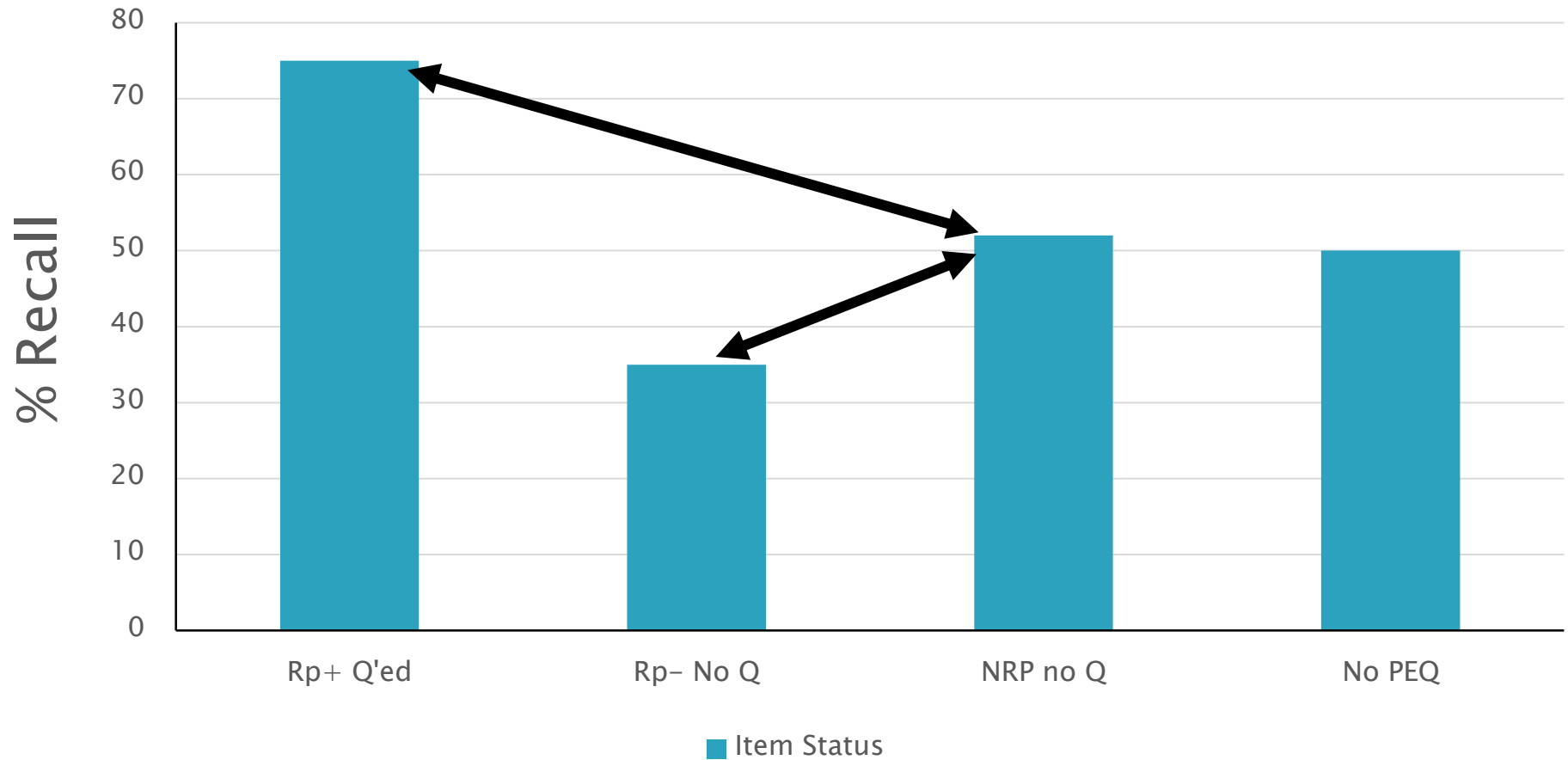
Incomplete Post-event Questioning takes place for ½
items from one category.
No items from another category questioned



Free Recall

Shaw et al. (1995)

% Recall of each item type



Practical Considerations

- ▶ Recalling and Forgetting details of suspects
 - MacLeod (2002)

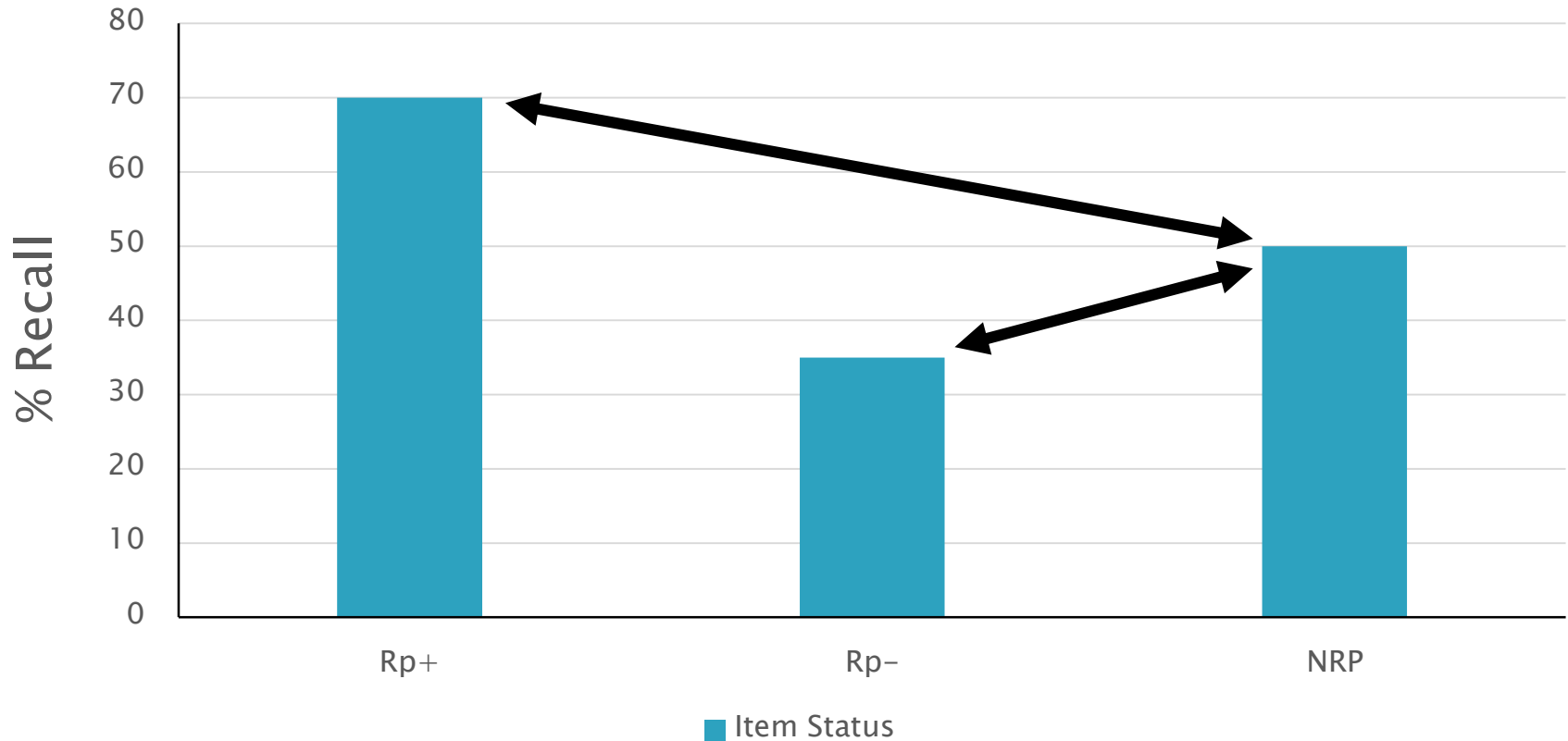
Slides
Blond woman
Brunette woman

Incomplete Post-event Questioning takes place for $\frac{1}{2}$ items from one category.
No items from another category questioned

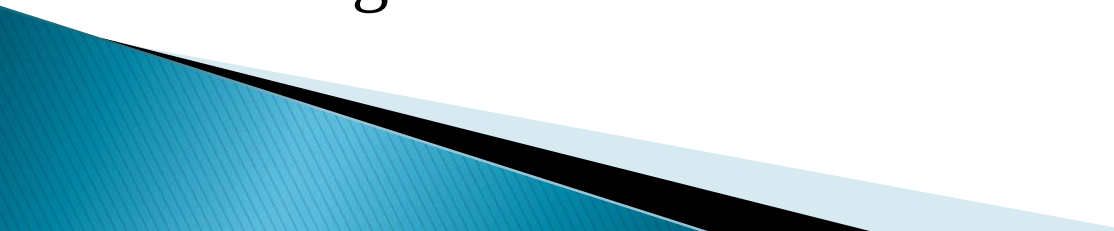
Free Recall

MacLeod (2002)

% Recall for each Item type



Conclusion

- ▶ Having an understanding of both the mechanisms and the conditions under which information is either consciously or unconsciously forgotten is of significant value to both theoretical concepts of memory and to real-life scenarios.
 - ▶ It gives us an understanding as to how we can function in an ever changing environment.
 - ▶ It can guide how police question eyewitnesses following an event and could potentially be used to help those suffering from various disorders.
- 

Finally....

- ▶ What was the number displayed at the start of the lecture?

Next Week...

- ▶ Lecture: Setting-up Experimental studies: Introduction to SuperLab (TK222)
 - ▶ Seminar: Exam Preparation and Guidance
- 