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Signal Detection versus Dual Process Explanations of Eyewitness ID Behaviour

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- Line-up Identification Accuracy
 - Relative Judgement Theory has been the prevailing explanation of eyewitness identification behaviour (Wells et al., 1998)
 - Eyewitnesses select the member that is relatively the most like the culprit

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- Empirical Data on Relative Strategy
 - Sequential line-ups decrease false alarms
 - Removing the suspect increases choice rate for next best foil
 - Self-reported use of a relative judgment strategy is associated with errors
 - Admonishment decreases false alarms

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- Empirical Data on Relative Strategy
 - Sequential line-ups decrease false alarms
 - Hits are also reduced (Stebly, 2001)
 - Removing the suspect increases choice rate for next best foil
 - This also occurs in sequential line-ups (Clark & Davey, 2005; Flowe & Ebbesen, 2007)

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- Empirical Data on Relative Strategy
 - Self-reported use of a relative judgment strategy is associated with errors
 - Participant eye movement behaviour and self-reports of decision processes are weakly correlated (Mansour et al., 2009)
 - Low line-up member similarity increases false alarms in sequential line-ups (e.g., Flowe & Ebbesen, 2007)
 - Admonishment decreases false alarms
 - Consistent with criterion explanation (Clark, 2005)

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Signal Detection Memory Framework

- Assumes a continuous memory strength process
- Recognition decisions are based on both recollection and familiarity, not on one process or the other (Mickes, Wais, & Wixted, 2009; Wixted, 2007; Wixted & Stretch, 2004)

From Squire, Wixted, & Clark (2007)

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Signal Detection Account

Unequal Variance SDT Model of Lineups

- Decision criterion placement varies depending on the task

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Dual Process SDT Account (Yonelinas, 2002)

- Memory retrieval is based on one of two processes: recollection (associative and contextual information) or familiarity

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A Recently Proposed Dual Process Account

- Trichotomous Theory of Recall (Brainerd, Reyna, & Howe, 2009)
 - combines the traditional dual processes of recollection and familiarity with a reconstruction process.
- Direct access retrieves episodic traces
- Reconstruction regenerates targets from episodic traces of relational information, especially from gist traces of meaning content
- Judgment is a signal detection process that consists of a familiarity signal and a bias parameter

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- Issues that arise in the application of SDT and DPT to face recognition:
 - Clear that source and contextual information important in eyewitness IDs
 - But what about face memory retrieval – what role does recollection (or direct access) play?
 - People are poor at describing faces (e.g., Lindsay, Martin & Webber, 1994)
 - People are poor at matching faces (e.g., Bruce et al., 1999)
 - Eye movements during retrieval are not associated with face remember/know judgments (Stacey, Walker, & Underwood, 2005)

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- Issues that arise in the application of SDT and DPT to face recognition:
 - Clear that source and contextual information important in eyewitness IDs
 - But what about face memory retrieval – what role does recollection (or direct access) play?
 - remembering versus knowing may not merely reflect differences in conceptual versus perceptual processing, but rather remembering may be related to distinctiveness, whilst familiarity accompanies appearance changes (Mantyla, 1997)

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- Issues that arise in the application of SDT and DPT to line-ups:
 - Time is an important variable in the legal system. Does the use of recollection- versus familiarity-based retrieval vary across retention interval?
 - Probably yes (e.g., Brainerd & Reyna 1996; Kintsch et al., 1990)
 - This suggests that familiarity may often play a greater role than recollection based processes in applied settings

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- Issues that arise in the application of SDT and DPT to line-ups:
 - Practical issues:
 - ✕ Testing SDT and dual process theories often relies on laboratory procedures that depart from applied practice
 - In line-up experiments, a single data point is collected
 - In a basic memory research paradigm, confidence would be taken for every face, and multiple line-up trials would be given to each participant

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Thank you!

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