

“Face Recall Systems”



Indecent Act
010118/9696



Aggravated Robbery
001123/8515



Aggravated Robbery
000717/0730

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Overview

- Motivation
- Face Recall Systems
 - Identikit
 - Photofit
 - Minolta Montage Synthesizer
 - Strip systems
 - Sketch artists
- Laboratory Studies
- Psychological Factors

Motivation

- Alphonse Bertillon and his *portrait parlé*
 - Designed to help detective retain info about known criminal
 - Also used as witness aid
- Considerations
 - Difficulty generating good verbal descriptions, witness drawings
 - Economical and convenient
 - But, does it work well?

Face Recall Systems

- Break face down into component features
- Operator assists witness in selecting components
- Features integrated by a variety of techniques
- Effectiveness?
 - Identikit: aid in clearing 5-10% cases (Venner, 1969)
 - Photofit: 25% “greatly assisted” cleared cases (Darnbrough, 1977)
- Identikit: line drawings printed on transparencies → layer to get composite face
- Photofit: photos of individual features → fit in special frame
- Minolta Montage Synthesizer: library of mugshots → optically blended composite
- Strip systems: dissect face into series of horizontal strips that can be exchanged
- Sketch artists: alternative to face-recall kit, traditional, complementary to kits

Laboratory Studies

- Issues
 - Establish system accuracy limits
(under controlled laboratory conditions)
 - Sensitivity to factors that normally influence accuracy
(e.g. performance fluctuations due to effects of sex and race)
 - Correlations of successful performance

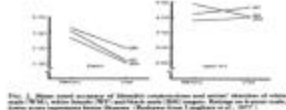
The Identikit

- Studies done by Laughery *et al* (1977)
- Method
 - Pairs of subjects (witnesses) talked to target person for 7-8 min, informed of required recall
 - Witnesses constructed likenesses of target from memory, one with sketch artist and one with Identikit technician
 - Artist and technician constructed likeness with target present (optimum performance)
 - Panels of judges rated similarity of sketches & Identikits to photos of target; computerized search algorithm to detect target in a “mug file”
 - 3 studies, 3 different types of targets: white males, white females, black males

Identikit

• Results

- Significant overall advantage for sketches compared to Identikit
 - Neither method effective for computerized search
- Sketches made w/ target present significantly better than those from memory, but no corresponding difference for Identikits in study with white targets
- For study with black targets, both sketch and Identikits made from view had higher likeness ratings than those from memory



Photofit

• Studies

- Encoding accuracy (Ellis *et al.*, 1975)
 - In Photofit, construct white male face that was itself a Photofit composite, with composite in view or after 10-s observation.
 - Construct from photos of white males from memory
- Effect of delay between observation and construction (Davies *et al.* 1978)
 - Construct from photos of white males seen for 10 s from memory immediately after observation, one week later
 - Construct three weeks later; also, recognize Photofit face among 36 mugshots to provide measure of trace strength for face
- Ability of Photofit to reflect fluctuations in trace strength and availability (Ellis)
 - Observe video of white male reading a passage; ½ attend to passage, ½ to face
 - Answer questions on passage and make Photofit impression

Photofit

- Sketches vs. Photofit (Ellis)
 - Witnesses sketched from photos; ½ w/ target in view, ½ from memory
- Influence of sex and race of witness (Ellis)
 - Male and female witnesses constructed likenesses of male and female target from memory, 10-s observation of each target
 - White Scottish and black African students made Photofits from memory of one black and one white face, 15-s observation

Photofit

• Results

- Encoding accuracy
 - Low- no subject completed a face entirely correctly but accuracy higher when task was done from view than from memory
- Effect of delay
 - Overall accuracy was low, but no effect was found for delay
 - While there was no effect for delay in construction of a Photofit, significant decline in recognition accuracy with a 3-week delay. Trace strength had great decline but this was not reflected in Photofit accuracy.
- Fluctuations in trace strength and availability
 - Subjects attending to passage had higher test scores but Photofits made by face-oriented subjects were rated no better than those made by passage-oriented subjects

Photofit

- Sketches vs. Photofit
 - Photofits were no better when composed from view than from memory
 - With target face present, Photofits much lower than subjects' own sketches
 - From memory, Photofits were marginally superior
- Influence of Sex
 - No differences in accuracy due to either the sex of the target or the sex of the witness, despite sex effects normally found in face recognition studies
- Influence of Race
 - Avg accuracy of composites of white targets almost 2x as high as for black
 - Differences in accuracy due to race of the witness were confined to composites of white targets
 - Despite usually reported effects of race, no effect found with composites of black targets

Relevance to Field Experience

- Both Identikit and Photofit have low sensitivity, demonstrated by failure to show superiority when construction made in presence of target; also, do not show expected fluctuations in performance
- However, both were capable of generating identifiable images, and, on occasion, showed expected sensitivity
- But, how relevant are the experiments to field operation?
 - Effect of emotive context when trying to encode face during a crime
 - Adverse character traits attributed by witnesses to criminal, distort composite
 - Training of technicians
 - Nature of the accuracy criteria in laboratory studies- too high?

Psychological Factors

- Interference effects in face recall
 - Don't appear to be any interference effects, maybe facilitation
 - Systems produce varying effects upon subsequent recognition, depending on style of operator (~verbal interrogation)
- Mode of representation
 - Line-drawn systems: not very life-like appearance
 - Photo: interpret composite as specific individual, not approx. likeness; study showed higher ID rates for photos
 - More like a real face composite becomes, greater the probability of identification despite any increase in specificity of image

Psychological Factors

- Range and representativeness of features
 - Photofit Library analysis: some redundancies and gaps in range of available features
 - Division of face may not accord with attributes to which witnesses attend, but studies suggest that no one feature or set of features is necessarily salient under all conditions
 - Allow greater freedom for independent manipulation of features
- Global versus analytic processing
 - Assumption of remembering faces by constituent features
 - Try systems allowing witnesses to operate on global strategy (Facefit)