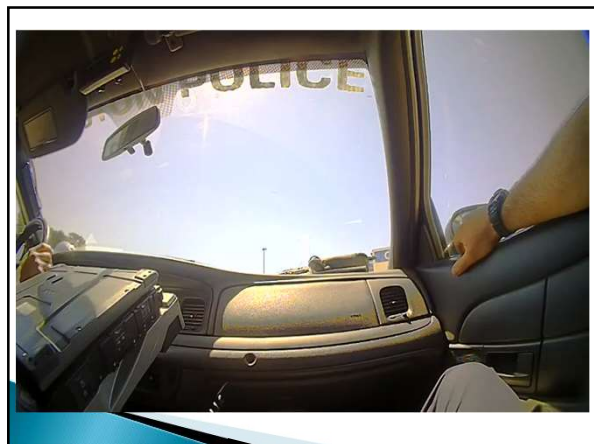


Memory, Video, and Truthfulness in Reporting a Use of Force

Avoiding and Explaining Incompleteness and Apparent Inconsistencies; Robert Higgason and Bradley A. Morefield



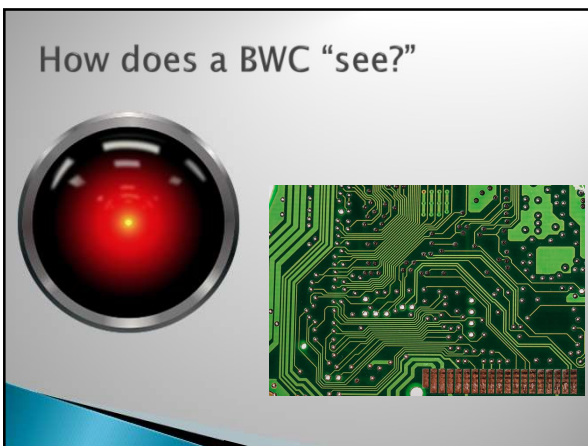




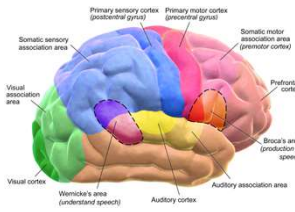
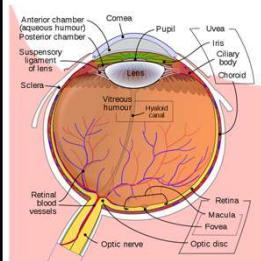
Outline

- ▶ Human capabilities v. BWC
- ▶ How memories are made
- ▶ Obstacles to objective recall
- ▶ Legal Implications

How does a BWC “see?”

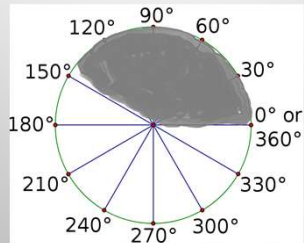


How do we see?

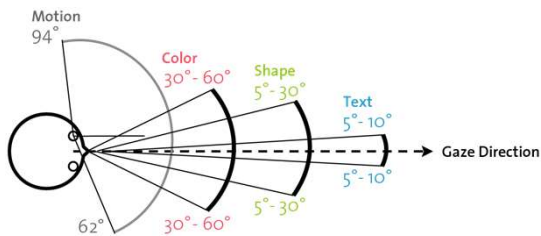


BWC- field of view

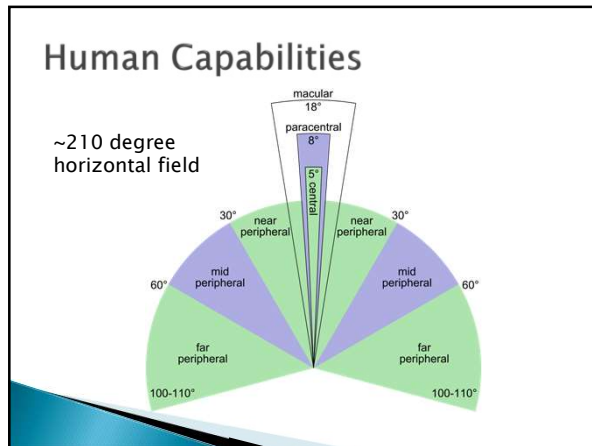
- ▶ 143 degrees (Axon 2)
- ▶ 130 degrees (WatchGuard Vista)
- ▶ 120 (Getac)

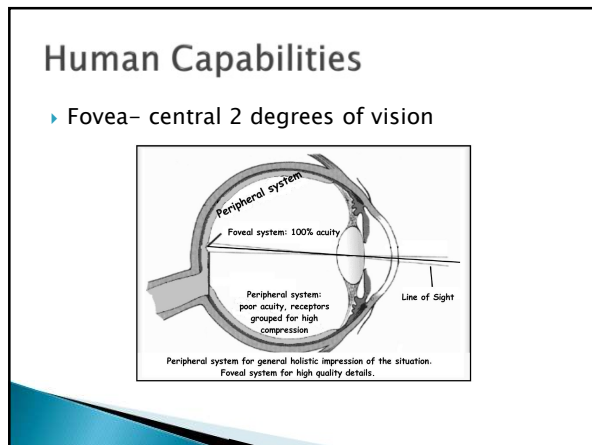


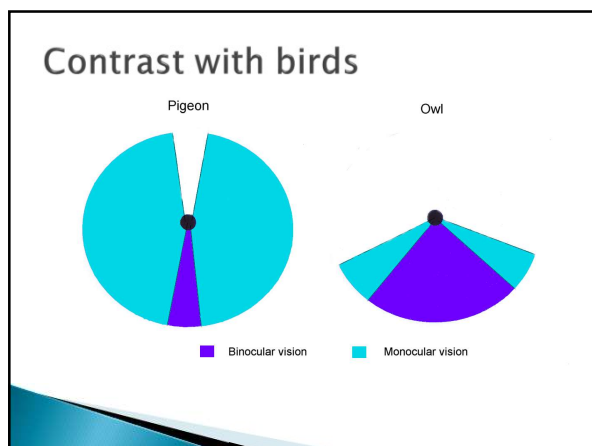
Human Capabilities



~150 degree vertical field

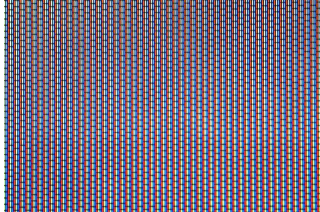






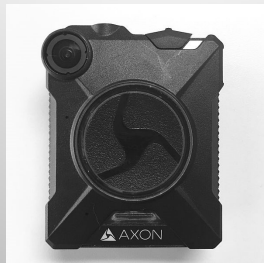
Resolution

- ▶ Pixel
 - “Any of the small discrete elements that together constitute an image.”
- ▶ Megapixel
 - 1 million pixels



BWC– resolution

- ▶ 1080 HD = **2.08 MP**
- ▶ 720p = **0.9 MP**
- ▶ 480p = **0.3 MP**
- ▶ No foveal vision to limit resolution



Human Capabilities

- ▶ Because of foveal vision, probably about **7–8 MP**
- ▶ With perfect conditions, maybe as much as over **500 MP!**



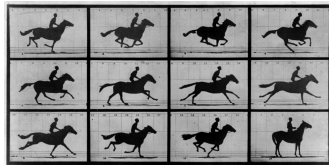
Contrast with TV / Phone

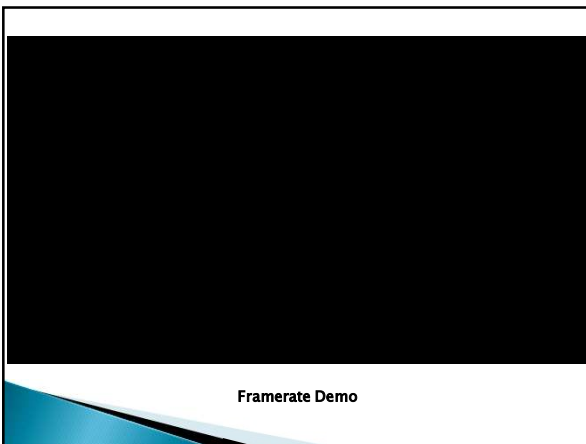
- ▶ 4k UHD TV = **8.294 MP**
- ▶ Iphone X = **12 MP**
- ▶ Both are possibly outside the range of the human eye!



Framerate

- ▶ Frequency at which consecutive images called frames appear on a display.
- ▶ Expressed as frames per second (fps) or hertz





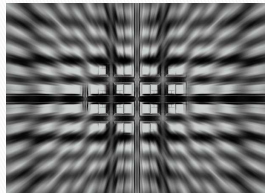
BWC- framerate

- ▶ 30 fps
- ▶ And no foveal vision to limit resolution



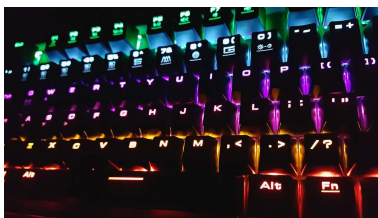
Human Capabilities

- ▶ Human eye can process high frame rates (or refresh rates)
- ▶ 120 to 200 Hz probably maxes capability of the eye
- ▶ But some can detect a frame even as high as 500 fps



Contrast with gaming

- ▶ Best common gaming is at 120 frames per second



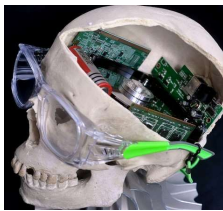
BWC- memory

- ▶ 32 GB (WatchGuard)
- ▶ 64 GB (Axon and Getac)



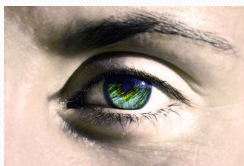
Human Capabilities

- ▶ Immediate storage- a few gigabytes
- ▶ Memory- est. 2.5 petabytes = 1 million gigabytes



Human Capabilities v BWC

- | | |
|-------------------------|--------------------|
| ▶ Light | ▶ Audio |
| ▶ Color | ▶ Processing times |
| ▶ Processor differences | |

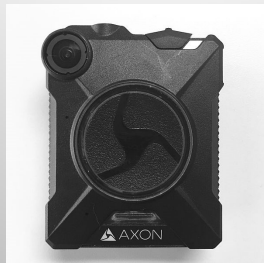


Other Factors

- ▶ Physical fitness of officer
- ▶ Amount of sleep officer had the night before
- ▶ Nutrition
- ▶ Hydration
- ▶ Dynamics of scene
 - How long has officer been under stress?
 - Has she physically exhausted herself through a fight, chase, etc.?

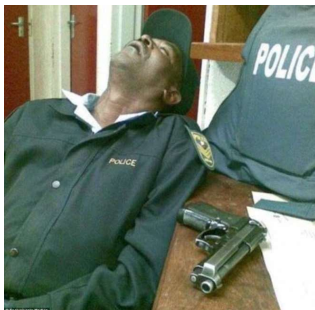
BWC– Battery Life

- ▶ 12+ hours



Human Capabilities– “battery life”

~18 hours



How memories are made

- Information coming in from multiple senses, vision being the major sense
- In a critical incident, such as use of force, there is too much coming in to process it all



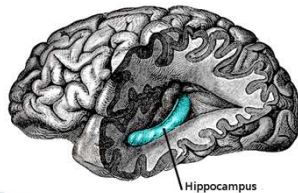
How memories are made



- Very important for officers to get a good night's rest after a critical incident
- Sleep, particularly the REM cycle, is where the information gets hardwired into the brain's neurons as a memory

How memories are made

- Hippocampus responsible for episodic (factual) memory, as opposed to procedural memory (playing an instrument) or semantic memory (general knowledge attained through experience)



How memories are made

- ▶ Flashbulb memory
 - Where were you when you heard about 9/11?
 - Do you remember where you were when you heard about the Challenger crash?
 - Flashbulb memories may focus on one part of the memory, excluding other information
 - Officers may have a flashbulb memory experience with a critical incident

Obstacles to factual recall

- ▶ "...human memory is not like a camera taking precise photographs of new experiences."
Grossman & Siddle
- ▶ Memory is based on perception, perception is influenced by bias, experience, and preconceived notions
- ▶ Memory can therefore be distorted by the baggage brought in

Human body in OIS

- ▶ Fear
- ▶ Fight or Flight
- ▶ Blood flow goes to muscles, away from brain
- ▶ Reduces capacity for thinking & reasoning which leads to perceptual distortions






Obstacles to factual recall

- ▶ Tunnel Vision
- ▶ Diminished Sound or Auditory Exclusion
- ▶ Heightened Visual Clarity
- ▶ Automatic Pilot
- ▶ Slow Motion (or Fast Motion) Time
- ▶ Memory Loss

Tunnel Vision

- ▶ Loss of peripheral vision
- ▶ Studies show that 37% – 79% of officers experience



Inattentional blindness

- Failure to register and consciously perceive a task-irrelevant object or change that was not previously part of the attentional set
- Your attention is drawn to a particular stimuli and you miss other information
- Example: gorilla walking through the experiment

Attentional Blink (AB)

- Images that appear in rapid succession are difficult to process
- If 2 images appear less than $\frac{1}{2}$ second apart, the participant can describe the first image with accuracy
- For the second image, accuracy reduces
- The attention is drawn to the first image and cannot process the second image with the same degree of accuracy

Attentional Blink (AB)

- It is possible that the first image is still being encoded into memory
- So the participant saw the second image, however the brain cannot process it into memory and therefore cannot remember it

AB and emotion

- ▶ If stimulus is accompanied by emotion, then AB generally decreases realizing greater attention
- ▶ However, if a neutral image follows an emotionally arousing image, the participant will describe the neutral image with less accuracy
- ▶ This is called **Emotion-Induced Blindness**

Surprise Capture

- ▶ Attention is influenced by expectations and surprise
- ▶ If something novel or unexpected occurs, it can capture the attention and slow processing because what is seen is not consistent with the expectation
- ▶ Example: call slip says that a male is running around with a gun. Officer arrives to find a female holding a curling iron

Diminished Sound– Auditory Exclusion

- ▶ Studies show that 42 – 82 % of officers experience diminished sound
- ▶ What might the BWC pick up that the officer did not hear?



Surprise Induced Deafness

- Auditory attention similar to visual attention
- Surprise Induced Deafness analogous to Surprise Induced Blindness
- Participants in study miss auditory signals presented in rapid succession
- Humans only have so much processing capability
- Also Auditory Attentional Blink

Heightened Visual Clarity

- 56% of officers experience heightened visual detail



Automatic Pilot

- According to one study, 78% of officers went into an automatic pilot.
- They just responded and did not think much about their actions.
- Implications for *Graham v. Conner* analysis?



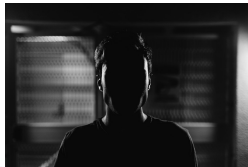
Slow Motion Time

- ▶ 34% – 67% of officers experience slow motion
- ▶ 15% – 23% experience time moving faster
- ▶ Implications for officer statements



Memory Loss

- ▶ 20% – 61% of officers experience memory loss
- ▶ Includes
 - Amnesia for parts of the incident
 - Altered memory sequence of events



Timing of the Interview

- ▶ 87 officers experienced simulated active armed offender scenes
- ▶ 2 experimental groups
 - Group 1 – completed questionnaire immediately following scenario AND again 2 days later
 - Group 2 – completed questionnaire ONLY 2 days later

▶ Porter, Ready & Alpert. "Officer-involved shootings: testing the effect of question timing on memory accuracy for stressful events." *Journal of Experimental Criminology* (2019) 15:1–28.

Timing of the Interview

- ▶ When to interview an officer following an OIS?
 - Officers subjectively believed that waiting 2 days to be interviewed was helpful to their memory
 - However, objective measurements showed that delay did not improve memory
 - Early questioning can aid memory retention
- ▶ Porter, Ready & Alpert. "Officer-involved shootings: testing the effect of question timing on memory accuracy for stressful events." *Journal of Experimental Criminology* (2019) 15:1–28.

Closing Thought

- ▶ "Understanding the limitations of officers' memory is, therefore, beneficial not only for investigators, but also the media, public and the courts. Police officers are often held to higher standards than the general public, but our findings show that, regardless of their specialist training, police officers are still vulnerable to the fallibilities of human memory."
- ▶ Porter, Ready & Alpert. "Officer-involved shootings: testing the effect of question timing on memory accuracy for stressful events." *Journal of Experimental Criminology* (2019) 15:1–28.

Thanks

- ▶ Patrol Tactics Unit, HPD
- ▶ Defensive Tactics Unit, HPD
- ▶ Liberty University Library

LIBERTY
UNIVERSITY