

- This presentation was part of a panel with Dr. David Klinger, Professor at the University of Missouri - St. Louis and Senior Fellow at the National Policing Institute in Washington, DC
- *** Attention ***
 - The notes accompanying these slides are intended only for the MHAAP Training and Education Sub-committee to provide a workable narrative for the slides and as a starting point in providing better context for the statements on the slides
 - These slides and notes reflect a review of a fragment of the literature on CEW, along with the intention to
 - educate on where knowledge on CEW still falls short
 - improve training and usage of CEW by the police
- Dr. Klinger's Research (not part of this slide deck) overlaps with our findings and is summarized in the corresponding abstract:
 - "Nonlethal weapons, such as electronic control weapons (ECDs), have become increasingly commonplace in American law enforcement as our society seeks to reduce citizen injuries and deaths at the hands of the police. There is reason to suspect, however, that police possession of nonlethal weapons such as ECDs can sometimes actually increase the likelihood that a citizen will suffer serious injury or death during an interaction with the police. This paper lays out the theoretical basis for this suspicion and presents empirical evidence that the presence of ECDs has led police officers to shoot citizens in numerous cases where they otherwise would not have discharged their firearms. Police leaders—and policy makers throughout the criminal justice system—should carefully consider the potential downside(s) of given technologies before adopting them and seek means to ameliorate negative consequences if they opt to adopt them."

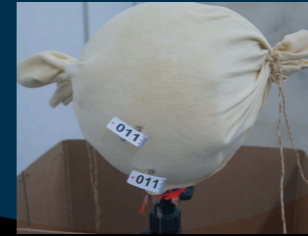
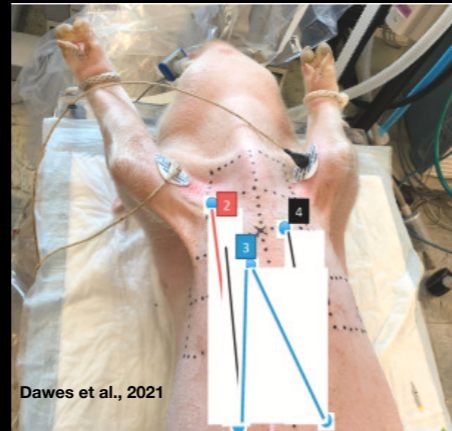
Literature

Analytic Strategy (Guba, 2008; Johnson et al., 2022)

- Web of Science
 - Search terms: **CEW - ECW - STUN GUN - TASER**
 - **890** peer-reviewed (inclusion criterion)
 - **392** after irrelevant categories eliminated (exclusion criterion)
 - **177** between 2015 and 2023 (inclusion criterion)
 - **52** after irrelevant papers eliminated (exclusion criterion)

- All this slide-deck reports is a review of the literature on conducted energy weapons (CEW, “Taser”) between 2015 and 2023
- We did not collect or observe any primary data for this study - we rather reviewed and analyzed scientific studies published by peer-reviewed journals
- Impetus for the study was the discrepancy between Ariel et al.’s randomized-controlled trial, which found an increase of use-of-force both lawful and excessive associated with the presence CEW, in face of an overwhelming body of literature that supports low risks associated with CEW
- The time-frame was chosen with a view to substantial changes in policy and training that govern police use of force in the aftermath of Ferguson

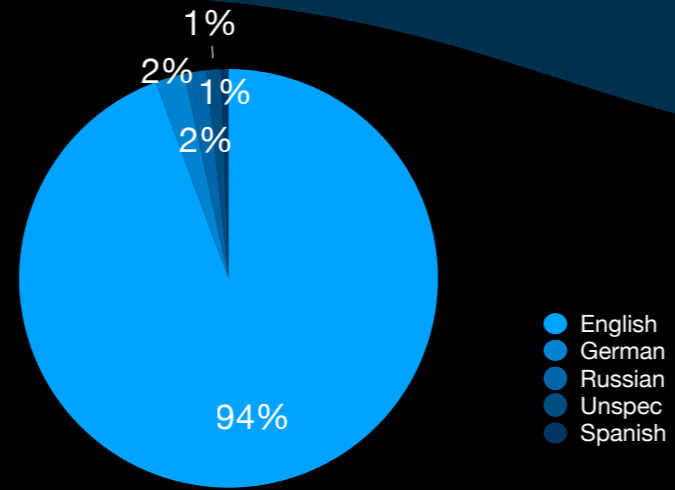
Literature



- This slide represents a large share of how taser trials are conducted:
 - Swine models in lieu of humans
 - Case-studies of specific CEW deployments (e.g. probe in eye, probe in finger as in the picture, etc., probe-bone/skull penetration as in the other picture)
 - Human trials

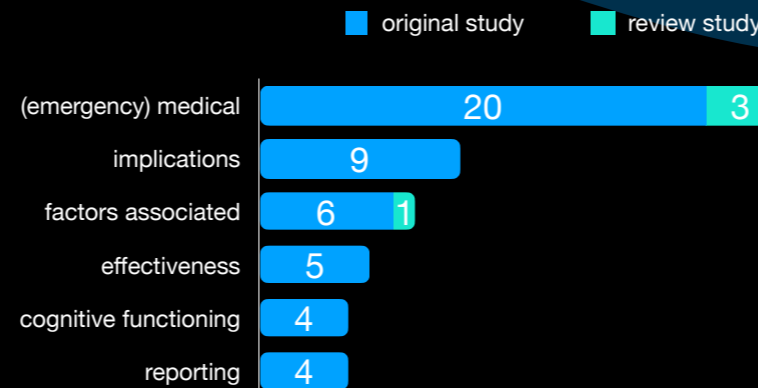
Literature

Languages



Literature

CEW: A discipline of disciplines...

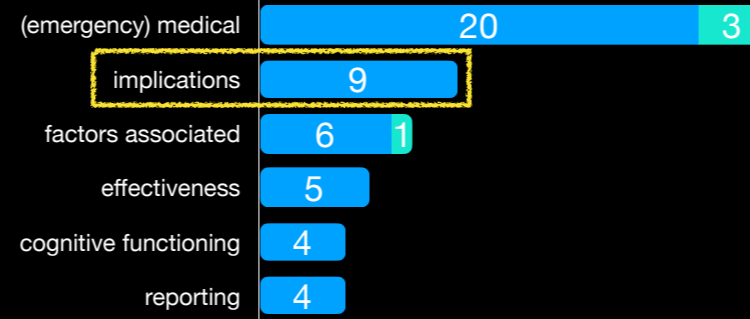


- There is a variety of disciplines concerned with a variety of subject matters associated with CEWs
- The 52 studies that have been reviewed can be broken down as listed on this slide:
 - (Emergency) medical studies: include studies on cardiac safety, safe probe removal, after-care, etc.
 - Implications (think downstream, after usage): are second-order effects of CEW usage, including on policy, training, and unintended consequences
 - Factors associated (think upstream, before/triggering usage): are suspect behaviours or characteristics (incl. mental illness or mental health crisis), and non human factors (such as technology, environment, and the mutually constitutive interactions between them)
 - Effectiveness: mainly comparative studies between different CEW models
 - Cognitive functioning: studies on CEW effects on cognitive functioning (think subject clarity after CEW use, which might have medical as well as legal implications (think rights to counsel and caution)
 - Reporting: studies on media coverage and statistical measurement of CEW usage (what counts as a “Taser use” - show/draw/spark/drive-stun/deploy probes)

Literature

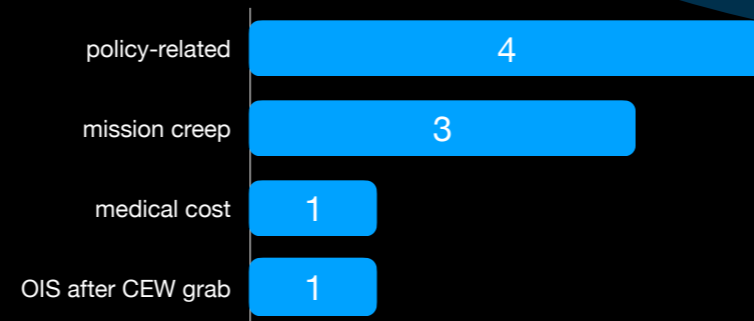
CEW: A discipline of disciplines...

■ original study ■ review study



Literature

Implications

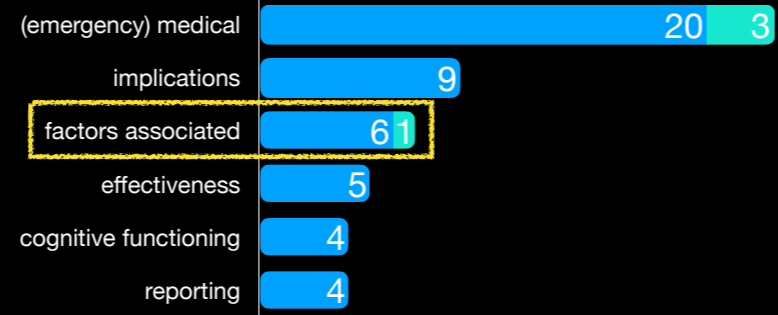


- Mission creep refers to the un-intended expansion of CEW usage beyond its originally intended scope (think, for instance, from “perfect for subjects armed with knives” to “any person who actively resists arrest”)
- OIS is short for officer-involved shooting

Literature

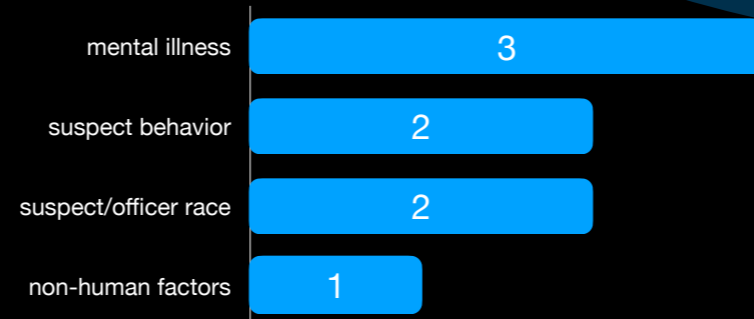
CEW: A discipline of disciplines...

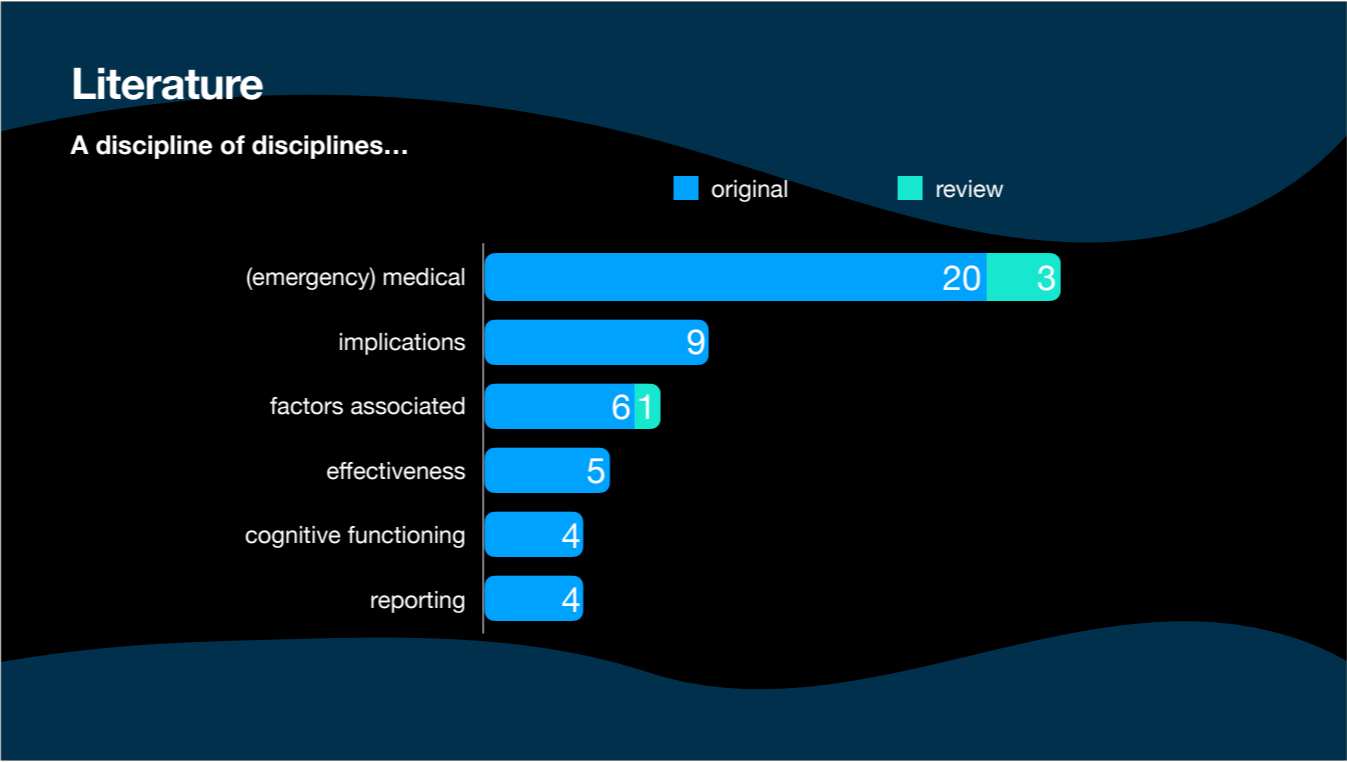
■ original ■ review



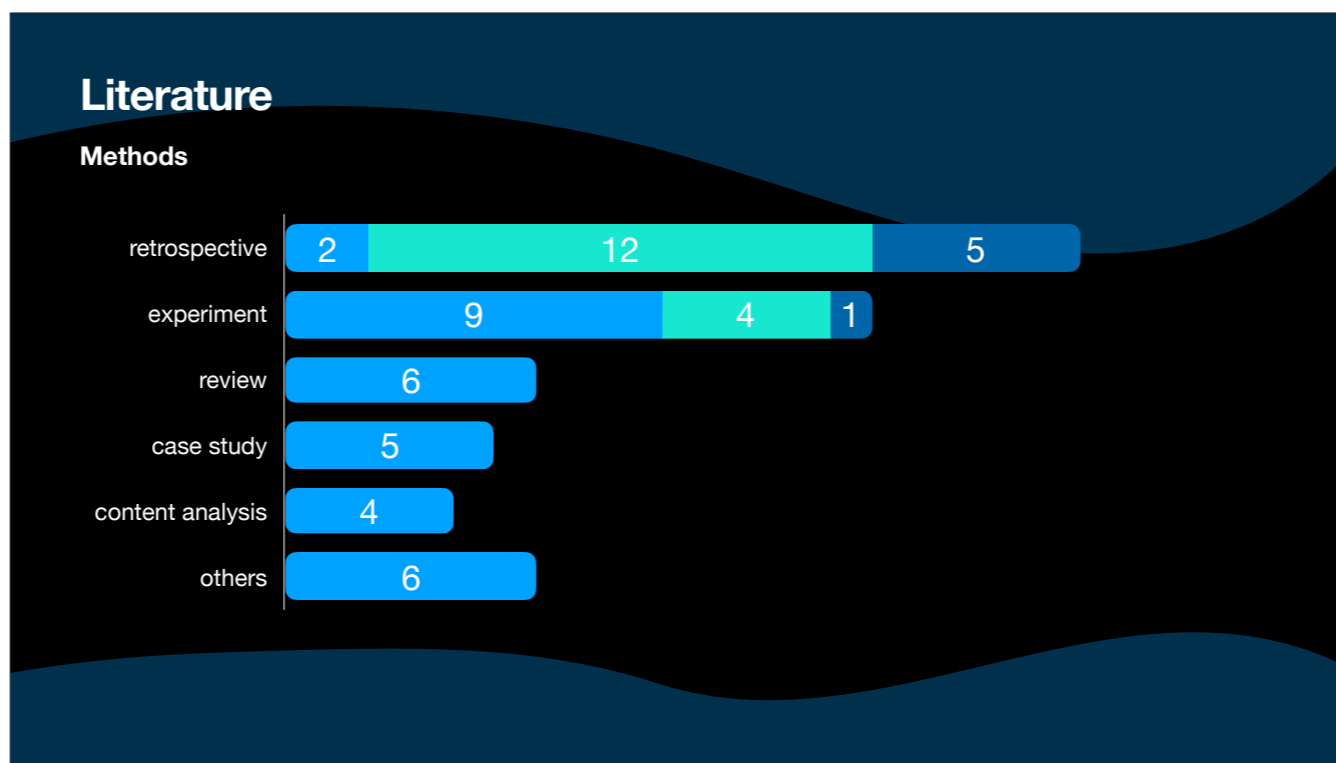
Literature

Factors associated





- Concluding a birds-eye-view on the substance that constitutes research on CEW for the purposes of this study, the slide deck moves on to take a look at the methods being used for this research:



- Legend:

- Retrospective: 17 studies in total, 12 of which utilized police data-sets, 5 health care and/or forensic data, and 2 other data-sets
- Experiment: 14 experiments in total, 4 of which were randomized-control and one randomized-controlled in a natural environment
- Others include social observations, interviews, surveys, and also a modelling study

Literature

2 Takeaways from the review

CEWs are **safe** BUT they do come with **unintended consequences**



- Medical studies, and most retrospective papers provide abundant evidence of CEW safety
- HOWEVER: our review of the implications as well as of the factors associated with CEW research also supports the notion that there are unintended consequences associated with it

Unintended Consequences (Merton, 1936)

- **the less-than-lethal weapons effect**

Ariel et al., 2019: n=678 officers, RCT

- **the law-of-the-instrument effect**

den Heyer, 2020 n=6,661 incidents, TSA
Sierra-Arevalo 2019 n=108 officers, interviews

- **the end-of-the-road problem**

Williams et al., 2021: n=1349 deaths, CA

- Less-than-lethal weapons effect: in analogy to what is known in aggression research as the “weapons effect”, the presence of CEW has been robustly associated with conflict escalation (in a randomized-controlled, natural experiment in the United Kingdom - keep in mind: CEW might stand out more and be perceived differently in a policing environment where officers are not armed for the most part)
- Law-of-the-instrument-effect (as per Kaplan (1964): “give the boy a hammer and everything he encounters needs pounding” (p.28):
 - Ex-proportionate roll-out
 - Ex-ponentially increased usage
 - Trend reversal: more deployment and less “show”-mode
 - Sierra-Arevalo adds invaluable qualitative research that is scarce at this point
- The end-of-the-road-problem: inspired by the 2019 APM “when tasers fail” investigation Williams et al. (2021) appear to corroborate the findings of the APM investigation: when CEW’s fail at incapacitating subjects (typically anywhere in between 60-80% at the time), lethal force is often the only option left
- Juxtaposing these 5 studies with a total of 52, the question arises as to why there is not more looking into such unintended consequences.

Biases

Why did it take 20 years to come up with these caveats?

- police data
- human research: typically police recruits or other healthy subjects
- Axon Enterprise, Inc., involvement (direct & indirect)
- significantly more quantitative than qualitative research

- Primarily, we identified these for biases in the literature
- Each of biases brings a set of blind spots with it (see following slides)
- It is these blind spots, which we feel both
 - Academics need to further investigate, and
 - Police to be aware of and mitigate corresponding caveats through training and potentially procedure

Biases

Police data

- for instance retro-studies: 12 (police data) vs 5 (health care data)
- blind spots:
 - citizen perspective
 - societal perspective

Biases

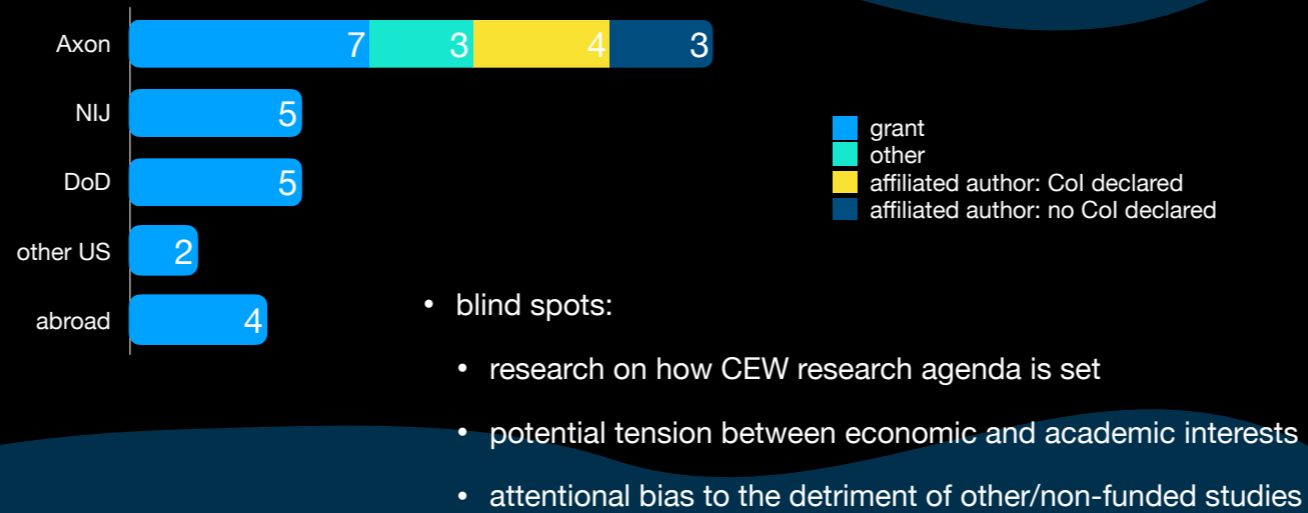
Human research bias towards police recruits and healthy volunteers

- for instance experiments: of 14 trials, 8 included human volunteers
(side-note: all 8 employing 5 seconds cycles only)
- blind spots:
 - substance interactions
 - mental illness interactions
 - physiological illness interactions

- all 14 experiments involved CEW deployment
- keep in mind, especially subjects going through crisis are often exposed to more than a single 5 second cycle

Biases

Funding and Conflict of Interest



- context from before this study's scope (< 2015): Adazadi et al. 2011 reported 46% of the studies they reviewed at the time were funded by Axon or written by an affiliated author, and 96% of these concluded "unlikely harmful" or "not harmful" at all

Biases

Quantitative over qualitative research

- only 1 in 5 of the reviewed studies (8 of 52) is qualitative
- blind spots:
 - theoretical diversity and complexity
 - epistemological constraints
 - axiological compromise

- Without qualitative research (case studies, interviews, observations, etc.), we cannot fully understand the impact of the CEW
- Epistemological constraints are limits as to the knowledge we can acquire about CEW: think how large-n trials with hundreds of CEW equipped officers or use-of-force reports of CEW deployments are only confirmatory research, as they test the hypothesis “CEW are safe” - without using qualitative research to come up with new questions to ask, i.e. new hypotheses to test (e.g. is there any/how high is the risk of post-traumatic stress disorder associated with being subjected to CEW, what are psychological/economic/legal costs, etc....) we are stuck in a “self-referential loop”