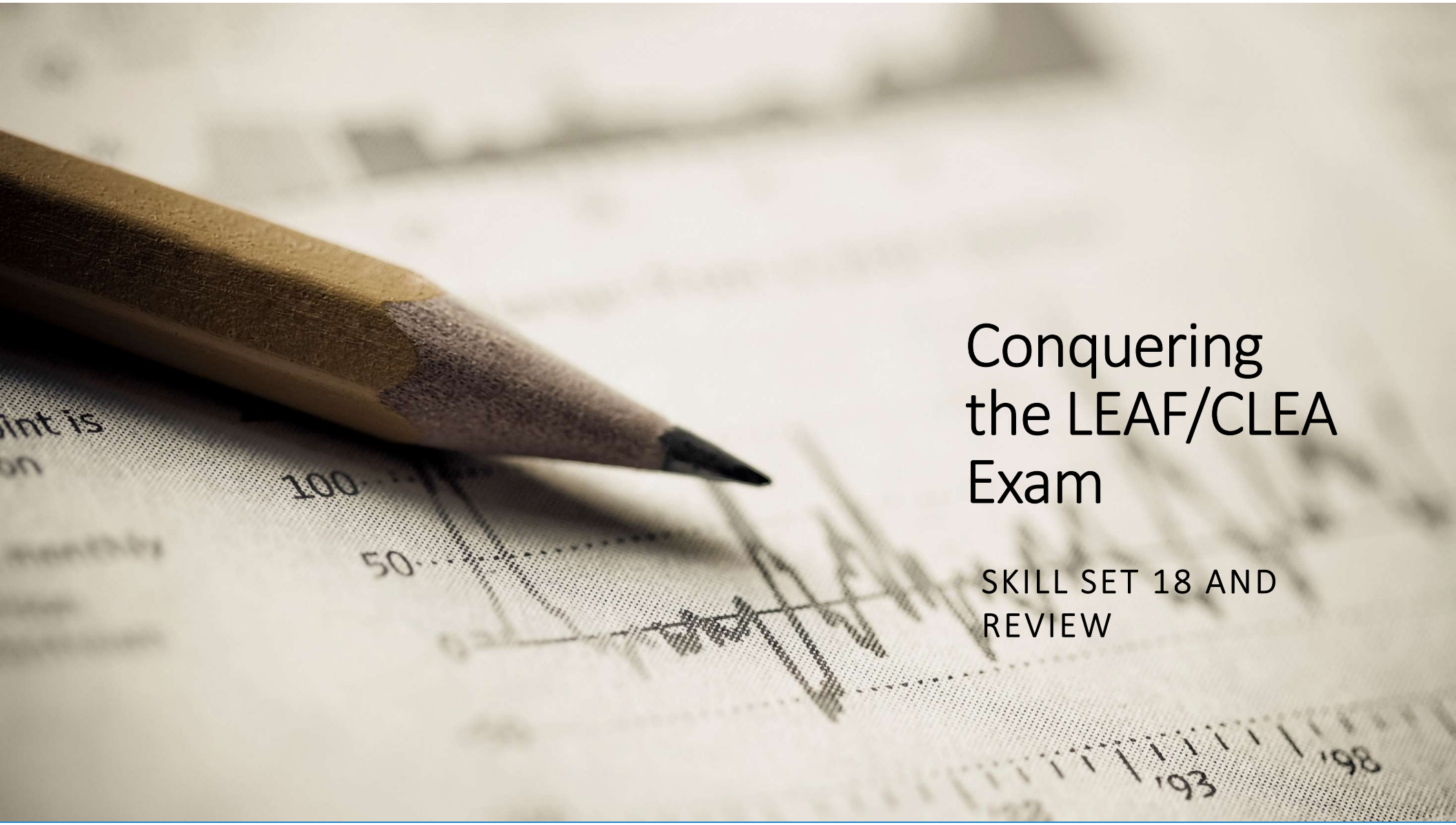


Conquering the LEAF/CLEA Exam

SKILL SET 18 AND REVIEW

About the Instructor/Course

- Instructor – Jenny Zawitz Jennifer.Zawitz@gmail.com
- CLEA Study Guide: https://www.iaca.net/assets/Files/CLEA_program_outline.pdf
- LEAF Study Guide: https://www.iaca.net/assets/docs/en_2021-LEAF-Program_Outline.pdf
- Exploring Crime Analysis: Readings on Essential Skills (3rd Edition) - IACA
- Each month will cover a different section of the study guide
- Intended as a supplement NOT a substitute for the texts and the Essential Skills classes
  - This course will help you focus your studying, but the courses and text will provide the actual understanding you need to pass the tests

Crime Series Analysis

SKILL SET 18

Crime Series Analysis

- Great conclusion to the course because uses many aspects of the crime analysis process discussed in this course
- Need reliable, current, and historical crime data and an organized relational database/spreadsheet to look at patterns
- Use descriptive statistics, temporal and spatial analysis
- Organize into an analytical product that communicates the problem and recommends solutions
- Short term crime problems that last a few weeks to several months that require rapid intervention to apprehend the offenders
- Should comprise the majority of workload of a tactical crime analyst

Critical Thinking in Crime Series Analysis

- First must identify a problem/crime series, becomes apparent by scanning available crime data and reviewing behavior/crime types for patterns (SARA model)
- Crime pattern as defined by IACA is two or more crime committed against strangers that share at least one commonality such as type of crime, behavior of offender, type of victim/property, location, with these characteristics differentiating the series from other crimes in the area.
- Next determine if the crime is committed by a single offender or a group of offenders working together.
- Finally, an evaluation of behavioral, spatial, and temporal elements of the series to provide information to detectives/patrol about intervention strategies, apprehension, deterrence, or prevention.

Reasoning (Review) and Fallacies

- Inductive – moving from specific concepts to general concepts. Exploratory in nature. Starts with one crime and seeks to identify related crimes based on MO/other similarities.
- Deductive – moving from general concepts to specific concepts. Start with a large data set and filter it by querying categories like crime type, location type, and MO to identify a crime series within a larger set. Narrow all burglaries by location type, area, and method of entry.
- Abductive – aka the most reasonable explanation. Used when there is incomplete information but still need to make conclusions about the information. Ex: robbery with two offenders but there are a few closely matching cases with only one offender. Use situational logic or "what is most reasonable".
- Logical fallacies: oversimplification (multiple causes reduced to just one), confirmation bias (tendency to seek out and assign more weight to data that confirms a hypothesis and to de-emphasize data that disproves a hypothesis). Can be skewed by one unrelated case/exclusions

Crime Series Behavior

- Theory particularly applicable to crime series analysis is Rational Choice Theory – offenders will weigh the perceived risk and punishment of a failed crime against the potential gain or reward of a successful crime. Short term decision making.
- Humans are creatures of habit with routines and gravitation to the familiar
- Behavioral repetition is the foundation of tactical crime series analysis and next-event prediction.
- Subconscious Decision-Making: subconscious mind quickly rates, filters, and discards options.
  - Can model this behavior and make predictions

Modus Operandi (MO)

- All the steps taken by the offender in the execution of the crime.
- LE information is limited to the actions that occurred during the crime.
- Note: highly stressful situations may skew the witnesses' memories to provide MO information.
  - Video surveillance may also be skewed. Need to weigh conflicting descriptions accordingly and not discount them.
- MO can be observed, reported, and inferred (abductive reasoning) based on evidence found at the crime scene.
- Can aid in linking crimes more effectively.
- Basic MO info: location type, point of entry, method of entry, property taken, but need additional information to indicate a unique process.

MO Continued

- Offenders will stick with what works until they discover elements of their MO that need to be adjusted or improved.
- MO Evolution – offender's MO may evolve and improve within the timespan of a crime series. A change can be attributed to gained experience, changing circumstances, and self-education.
- Mission Creep – shift in objectives during a mission or project. Offender's tendency to commit different crimes over time to increase rewards, minimize risk or obtain resources.
- Cases can be linked to a series even if the initial MO has changed
- Both evolution and mission creep should be considered in long-term crime series where the offender may have periods of inactivity and return with variations in MO.

Linkage Analysis

- Process of linking crimes committed by an offender to a crime series.
- First step in tactical crime analysis
- Two methods: Matrix Analysis and Content Analysis
  - Matrix Analysis: allows an analyst to search data related to numerous crimes in a fast and efficient way
  - Content Analysis: reading police report narratives in order to identify MO factors to link crimes
  - Can use these in conjunction
- Accuracy may be impacted by offender illness, unrelated arrest, work schedule, mental illness, or substance abuse
- Note IZE method (discussed later) is a form of matrix analysis

Crime Types

- Crime series analysis is effective with stranger-on-stranger crime – homicide, sexual assault, robbery, and indecent exposure.
- Can also be used for property crime – burglary is most common but also auto theft, theft from vehicles, shoplifting, arson, vandalism, fraud, etc.
- Person crimes – determining MO may be tricky because of the unreliability of eye witness testimony. May need to get creative.
- Property crime – want to collect location type, method and point of entry, which rooms were entered, if they were ransacked, what they stole, security measures, etc.
- Crime categorization may be subjective.

The IZE Method

- Method of matrix analysis
- 5 step process that improves the ability to detect crime series in your data.
  - Categorize: create a table with variables on it
  - Generalize: create general values to allow for standard searching.
  - Organize: Group similar variables together in the matrix both vertically and horizontally and sort your data in order to visually find clusters of data. Move related data next to each other and sort other columns to see whether clusters of data exist.
  - Minimize: reduce data further by querying for similar variables and keywords. Once you find similar cases, query the cases against other variables until you get a core group of cases (aka your crime series). These become your **archetype** or your summary of crimes in a series that can be used for comparison for future crimes
  - Maximize: query data again using the archetype to see if you missed any similar cases. There may be cases that aren't a perfect match but may fit the series.
- Always contact other jurisdictions to see if similar cases exist.

Analysis of a Crime Series

- What: Crime type – includes more than just the type of crime reported. Also includes defining characteristics like cigarette store burglaries. The crime type is usually the starting point to determine if a particular case should be included in the series.
- How: Behavior – MO. Steps offender took to commit a crime. How are they related in this series.
- Where: Space or location – geography or location type forms the spatial aspect of series analysis. Includes type and availability of suitable targets, proximity to significant locations/routes, distance, means of travel, and anchor points.
- When: Time – when events occurred, duration of the crime, frequency/intervals between incidents. May help find a personal pattern of the offender.
- Don't have to have who and why right away to identify a series. If know who, can use that to link other crimes to the series that have not been previously identified. Why may vary from crime to crime or offender to offender.

Behavior, Space, and Time

- Once series is identified, effective analysis starts with describing these which influenced the offender's decision to commit the crime.
- Behavior: description of the MO factors from all related cases. May be the ones observed most frequently, important to the success of the crime, or were unique.
- Space: geography of the crime scene including decision of where to commit the crime, location type/target, how far to travel and how, order of targets, and selection of new targets.
  - Consider awareness spaces or mental maps which for offenders include their preferred offender area. Area familiar to the offender for available targets, transportation, experience, etc.
- Time: timing of incidents including hour, day of week, tempo and interval, and periods of inactivity. Depicts hot spots via temporal topography when crimes occur over a 24/7 period that makes up a week. Don't forget to use aoristic analysis with property crimes that might span hours so that the weighted times better reflect times of the crime to occur.

Crime Spree

- Specific type of series characterized by high frequency of criminal activity within a short time frame to the extent that the activity appears almost continuous.
- More common in property crime series, possibly because motivation of the offender and targets remain stable for a period of time as the crimes go undetected.
- Note: series analysis relies on a combination of statistical calculations, application of crime and criminal behavior theory, and critical reasoning skills. No single solution for analyzing series/predicting next events.

Next Event Prediction (Spatial Forecast)

- Tactical analysis, described behavior/space/time of a crime, can **inform** a prediction of the next event in the series.
- Different from a forecast of crime that projects increases and decreases in crimes and trends over time in an area.
- While normal statistical calculations may not be appropriate, can do things like mean spider distance which is where the crimes are measured from the arithmetic center of the series. Can also measure the distance from each crime to the next, the plots the mean and standard deviation to determine likely distance to the next crime (mean sequence distance).
- Both of these can be used in conjunction (overlay) and show how compact or dispersed the offender's awareness area is. Can also show lags and offender movement over time.
- Recall mean nearest neighbor calculations to determine if crimes are spatially clustered, dispersed, or random and inform kernel density estimation to predict where future crimes may occur.

Next Event Prediction (Temporal Forecast)

- Compares clusters and sprees in time with intervals/periods of inactivity to determine the tempo or frequency of incidents
- Tempo may increase as the offender gets bolder/more experienced or decrease as targets become more scarce
- Timing may be influenced by the offender's needs (money, drugs, etc.) or if the offender encounters an issue in his personal life
- Time and space should be evaluated together to identify patterns in movement over time.

- Note: not all crime series will be conducive to next event prediction.

Crime Series Bulletin (Review)

- Must be tailored to your audience.
- Can be lengthy if you intend to send it cross jurisdictionally for those that need the additional information (detectives/analysts) but prefer brief and specific
- Need: clarity, coherent writing, consistency, concise writing
- Notify police agencies about the existence of a pattern or series and describe it's relevant characteristics
- May suggest potential suspects, forecast future events, provide investigative leads, and suggest possible strategies.
- Appeal to line-level personnel and immediate supervisors.
- Provide enough information for officers and detectives to take personal individual initiative and provide enough information for supervisors to plan broader tactics.

Crime Series Bulletin To Include

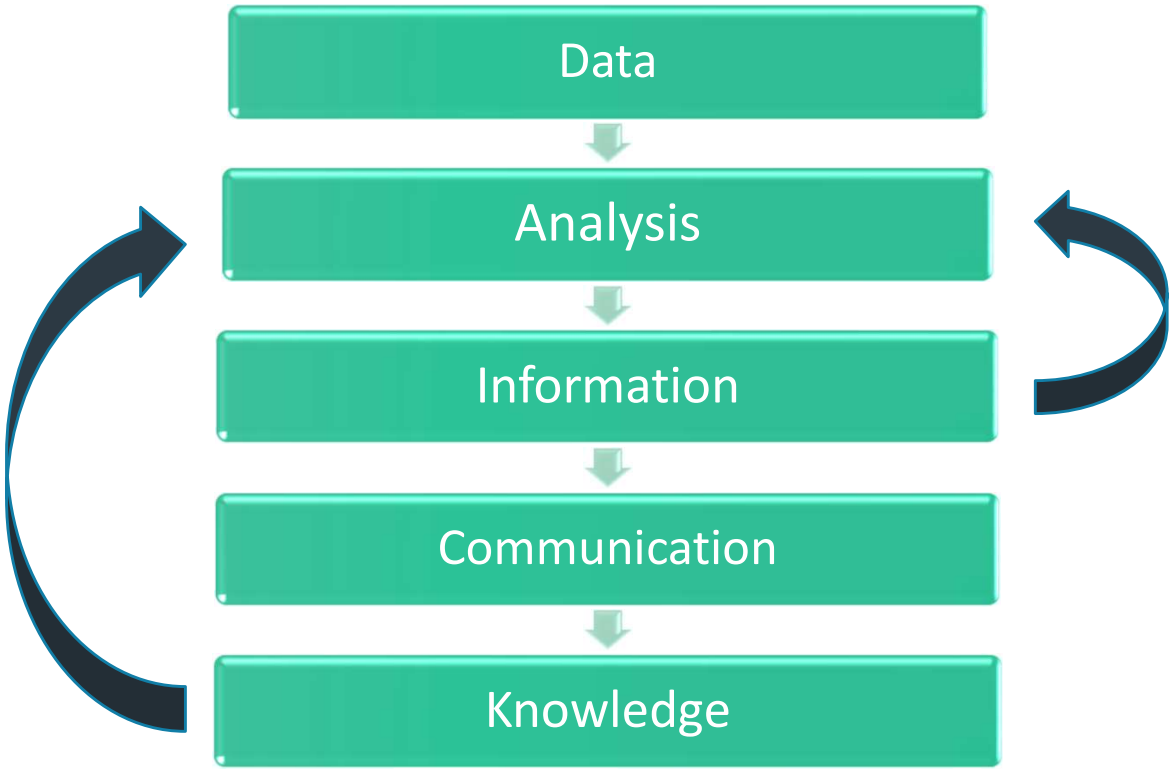
- Behavior/MO: short descriptive summary of the crime series (type, victim, weapon, what taken, significant behavior linking the offender's behavior)
- Related Incidents: list of cases with dates/time/address/agency reporting number, etc.
- Offender/Vehicle Description: include surveillance stills if possible
- Space: visually appealing, relevant, and informative maps with scale, north arrow, title, and borders/roads/labels for reference
- Time: include timeline with tempo and clusters of incidents, with DOW/TOD for hotspots
- Next-Event Prediction: backed by data and well supported in analysis with actionable recs
- Recommendations: can use this instead of prediction. Provide actionable enforcement
- Caveats: always mark dissemination restrictions (LE Dissemination Only) in red

Crime Bulletin Dissemination/Updates

- Timeliness is crucial in dissemination of the bulletin
- Note that command will need time to develop an action plan
- Disseminate to officers/detectives and make it easily available for future use
- Think outside of jurisdictional boundaries
- Monitor and update the matrix/bulletins/series as more events occur
- Crime series bulletins are not usually part of the investigative case file for prosecution and discovery unless the officer mentions it in his report.
- Often considered investigative leads and should be independently corroborated through other investigative resources (offender interviews, police surveillance, witness statements, phone tracking, etc.).
- This is not finished intelligence sine will be reanalyzed when other crimes occur.

Review

Data vs. Information vs. Knowledge vs. Intelligence



Self-feeding loop – new data juxtaposed against existing information and knowledge to create further analysis

Information vs. Intelligence– Information is the product of analysis of data. Intelligence is information that has operational value (a product rather than a source of analysis)

Actionable

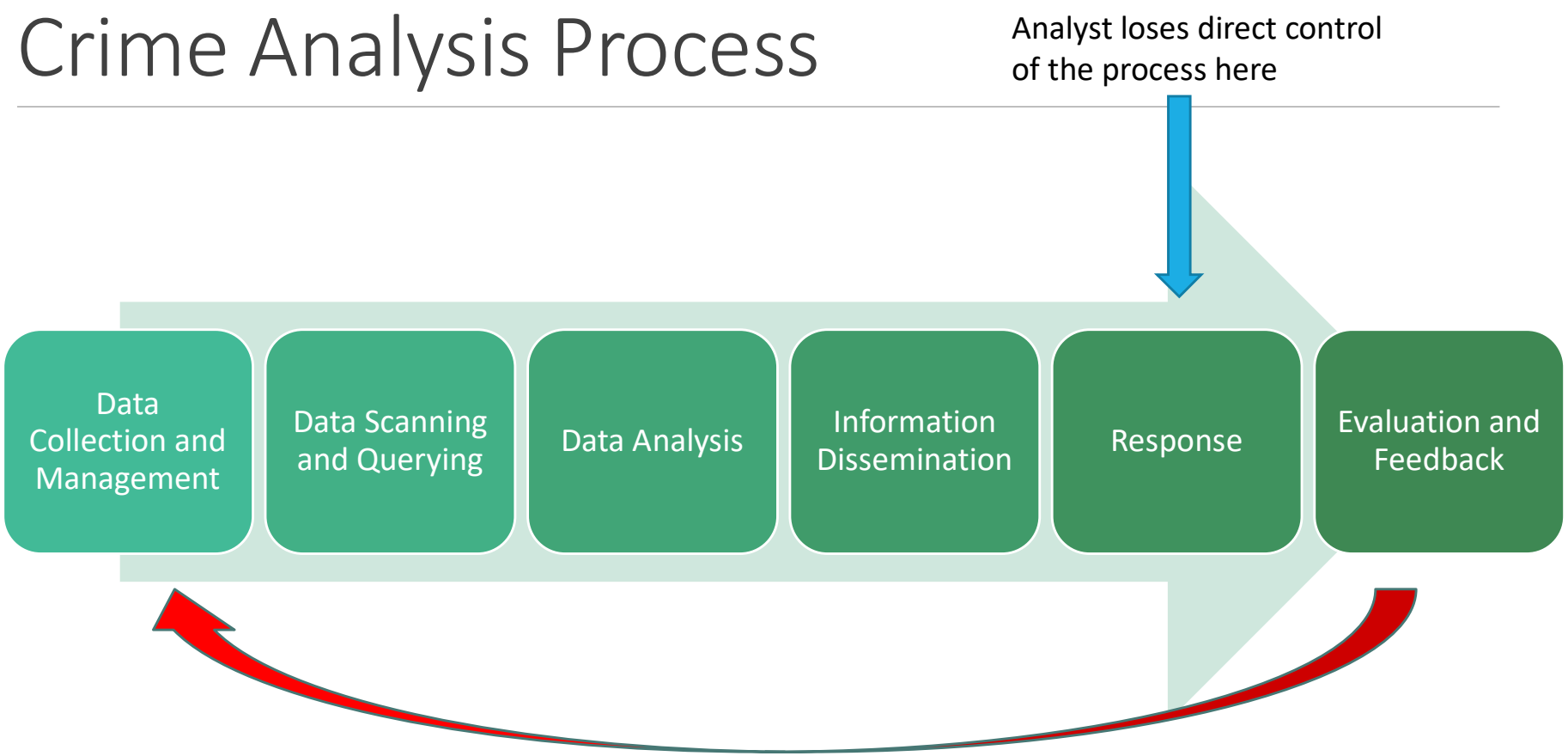
Knowledge Needed Before Starting

Knowledge of crime/criminal behavior, policing/police strategy, about jurisdiction, about the agency

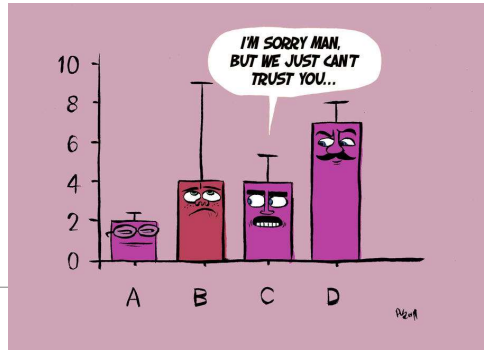
Types of Crime Analysis
(Recognized by IACA)

Tactical Crime Analysis ➢ Short term development of priorities/resources ➢ Patrol and investigative ➢ Ex: high-profile crime, repeat incidents, crime patterns/series	**Strategic Crime Analysis** ➢ Long term strategies, policies, and prevention ➢ Long term statistical trends, hot spots, problems ➢ Ex: ongoing prostitution/drug issues
Crime Intelligence Analysis ➢ Analysis of people involved in crime ➢ Understand the lives/activities/jobs ➢ Understand networks of crime ➢ Ex: repeat offenders, repeat victims, criminal organizations/networks ➢ Mitigation may mean priority enforcement or deterrence	**Administrative Analysis** ➢ Needs of the agency/community ➢ Shouldn't take up too much time ➢ Ex: workload analysis by area/shift, officer activity report, responding to media requests/grant applications, reports for community groups.

Crime Analysis Process



Types of Data



QUALITATIVE

- Non-numerical data collected as narratives
- Ex: comments in CFS, police report narratives
- Intelligence analysis and tactical analysis

PRIMARY

- Original data collected to answer a specific question.
- Can be from interviews, focus groups, surveys, observations of environment
- Can be qualitative or quantitative

QUANTITATIVE

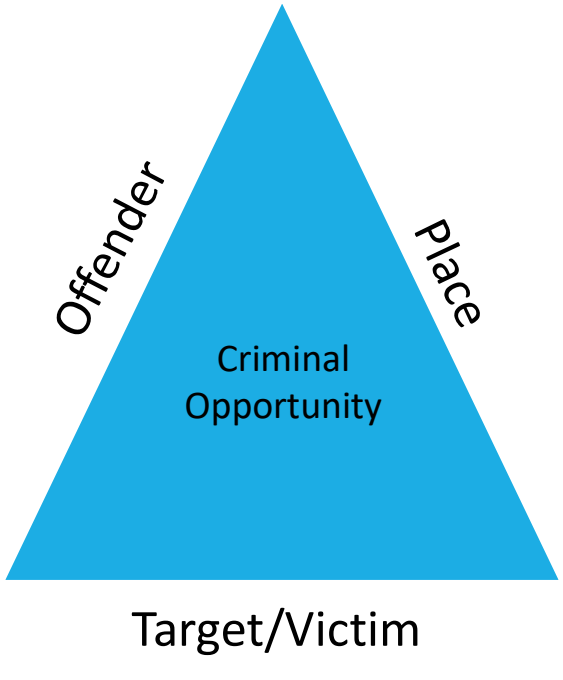
- Numerical or categorical data with discrete, short variable values
- Ex: incident no., report date, disposition code
- Strategic and administrative analysis

SECONDARY

- Data collected for other purposes now used to re-examine and answer a different question.
- Common in crime analysis – calls for service, crime reports, traffic crash reports, citations, arrests, etc.
- Can be qualitative or quantitative

The Crime Triangle

Based in RAT – crime occurs where likely offenders, suitable target, and lack of a capable guardian meet



SARA

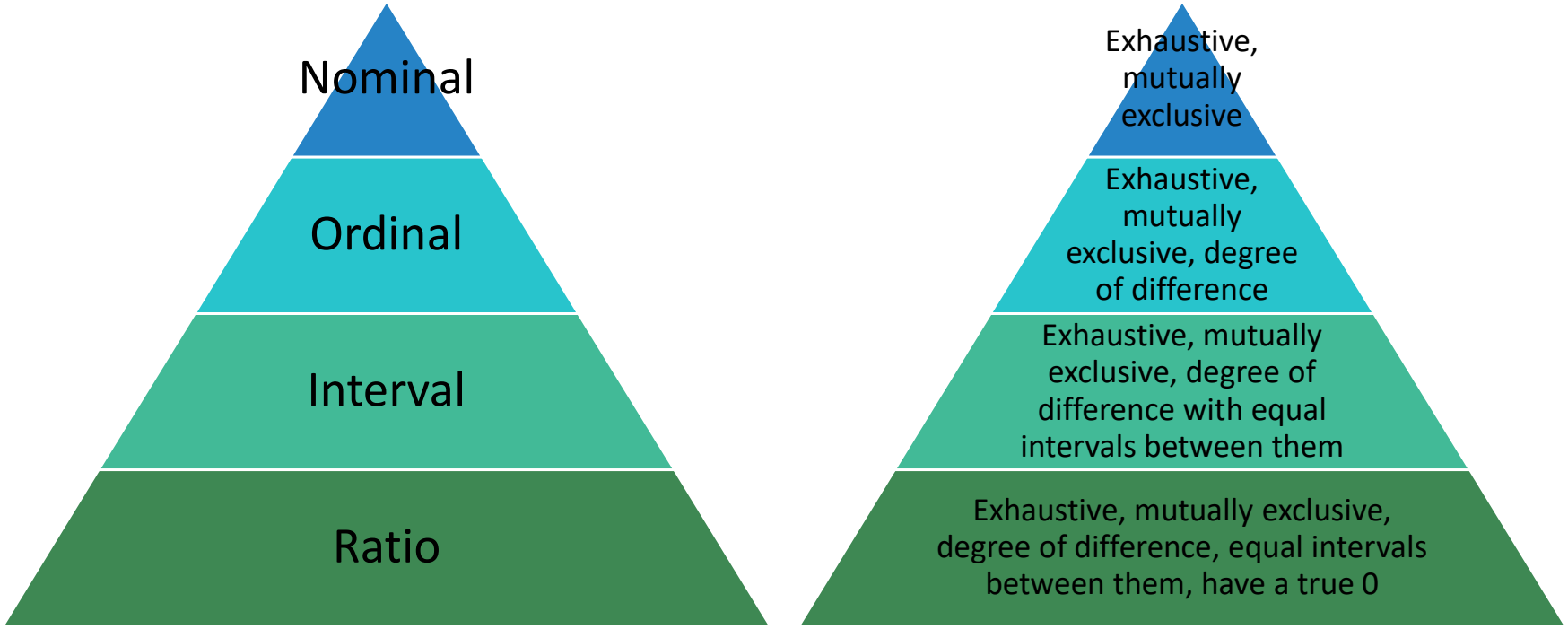
Four Step Approach to Systematically Solve Problems

- S: Scan – identify a problem
- A: Analysis - examine the nature and characteristics of a problem
- R: Response – implement a strategy to reduce or improve the problem based on the analysis
- A: Assessment – evaluate the extent to which the response improved the problem.
- Analogous to applied research model as it follows the same linear process.
- Evaluations of POP indicate that analysis and assessment are weak spots as police are conditioned to respond quickly to fix a problem. These responses may be based on intuitive judgement and professional experience but may lack a foundation in empirical evidence and may not be effective for a long-lasting response.

Qualitative vs. Quantitative Method

- Quantitative method: relies on counts and statistics to determine frequency of criminal activity, volume of crime, correlation between crime and other factors, etc.
- Qualitative analysis: based on direct observations or quotes from subjects and on the assessment of field notes or source data. It focuses on meaning of behavior.
- Qualitative analysis incorporates field research, document/content analysis, interviews, social media postings, and cultural perspectives.
- Need critical thinking to determine relevance of data collected.
- Conducting content analysis over a year or a decade can provide information about what is important to the community. Compare what is written about in local media to your agency's position. Can also provide insight into public relations, community policing, and department image/morale. (Administrative Analysis)

Levels of Measurement

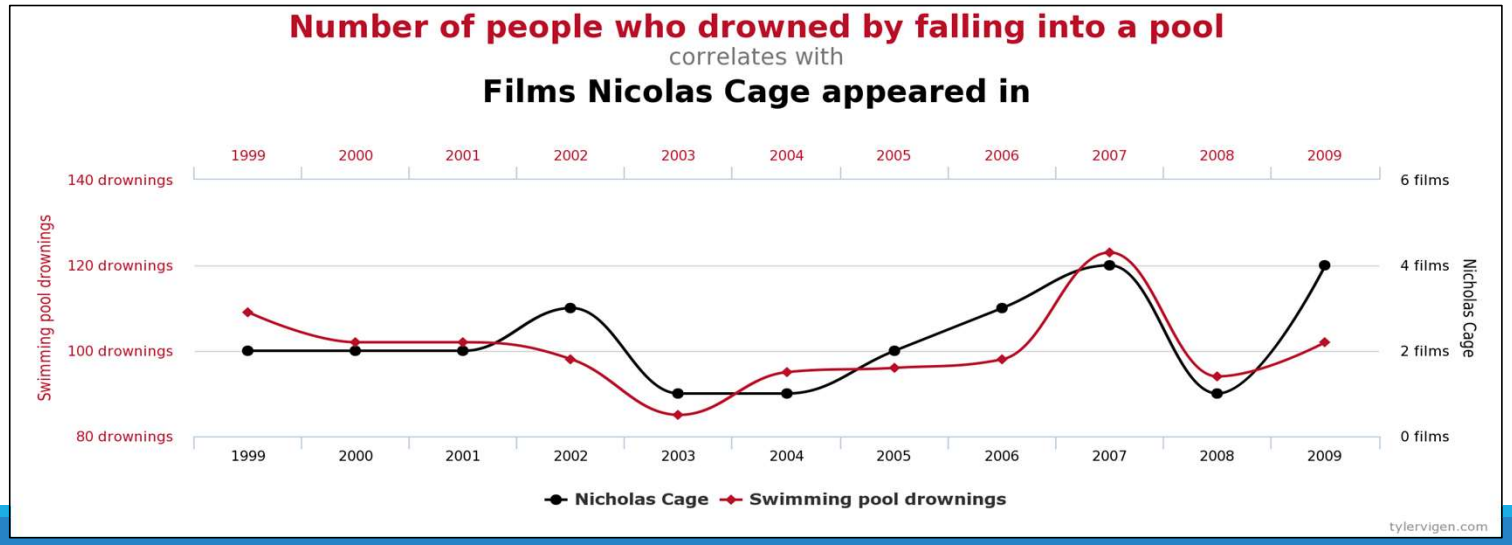


Measures of Central Tendency

- Mean: Average. Distribution of data can only have one mean.
  - Distribution impacted by outliers or extreme scores.
  - Useful with interval and ratio data
- Median: Midpoint or middle score of the distribution.
  - Point where 50% of scores are above the median and 50% are below.
  - Strength in that it is not impacted by extreme scores
  - If odd number of cases, rank order the scores and determine the middle case
    - (n + 1) / 2 with n being the total number of cases
  - If even number of cases, average the two cases at the midpoint.
- Mode: most frequent score
  - Can be unimodal (one mode) or multimodal (more than one mode)
  - Best used with nominal data.

Inferential Statistics

- Correlation and Regression Analysis
- Descriptive statistics describe the characteristics of a particular data set. Inferential statistics are used to draw or infer conclusions about a larger population based on a sample.
- Relationship between two or more variables to see how they relate to each other.



Vigen, T. (2014), https://www.tylervigen.com/

Types of Maps Used by Crime Analysts

- Pin Map: show a simple, single event or series and the locations of the crimes.
- Choropleth map or shaded grid map: shows the distribution of crime across a particular area.
- Hotspot map: shows hotspots located across a jurisdiction that are related to multiple criminal events or a series of connected criminal events
- Map Data: real world data are represented by four feature types in GIS
  - Point Features: discreate locations typically shown by a figure or symbol
  - Line Features: geographic feature represented by a line or set of lines (streets, railroads, bus routes)
  - Polygon Features: multisided figure represented by a closed set of lines (city boundary, census tract, police beat, neighborhood). May be very large or very small (park). AKA **vector types** in that they have finite limits, locations, beginning and end points, and do not cover the entire surface of the map.
  - Image Features: vertical photo (satellite/plane photo) that is digitized and placed within the GIS coordinates associated with it. AKA **raster images** because they are small pixels of data that cover the entire service of the map and each pixel ahs some value.

Conclusions

- Read the books and take the classes to strengthen understanding.
- Try to apply the things learned to your every day work to “make them stick”.
- Use the study guides.
  - https://iaca.net/about-clea/ (links for program outline and study guides here)
  - https://iaca.net/about-leaf/ (links for program outline and study guides here)
- Next month: Applied Crime Series Analysis (Skill Set 18) and Overall Review.

Any questions?