Kia/Hyundai Theft Crisis

Audience

This data story is intended for a broad audience, including the public (especially current and potential Kia and Hyundai owners), local government officials, and automotive industry stakeholders. Interpreting data for a broad audience must be presented, easily understood, and engaging. Technical jargon should be avoided at all costs. We want to educate and empower, not inundate them with detailed data. For the public, they are focused on protecting their lives and property. Government officials and the industry need to understand just how momentous this issue is and how critical and urgent it is or isn't for systemic solutions.

Purpose

The primary objective of this data story is to draw attention to the growing epidemic of Kia and Hyundai vehicle thefts due to a highly publicized vulnerability to a hack. The intention is to go beyond information sharing to a direct call to action. We want the audience to understand the scope and rapid rise of this issue and how this affects certain vehicles, and feel compelled to take action to get ahead of the curve.

Call to Action

The call to action is two-fold: for vehicle owners to act regarding their vehicle security (upgrades and locks & updated software) and for manufacturers and governments to take swifter action to develop permanent fixes and public service campaigns.

Medium

Recognizing the range of audiences and the importance of a broad reach and immediate impact regarding public engagement and policy, the format of choice is a series of eye-catching infographics and data visualizations that can be easily distributed through social media, public service announcements, and community presentations. A clear written report (this paper) supports the

infographics and data visualizations to provide context, nuances, and the call to action. Multi-platforms create a digestible and shareable format for further public engagement and policy impact opportunities.

Design

The design approach we took centers on clarity, impact, and emotion. While we utilized several elements to clarify understanding, we used some Gestalt principles to guide the viewer's eye intentionally.

- **Color:** We universally applied a "red" for Kia/Hyundai thefts and a "steel blue" for all other thefts, presenting a significant contrast. The use of red signals an immediate need for attention (urgency), danger, and a warning that something is going wrong. Without any additional explanatory text, we wanted red to ensure focus on the issue of Kia/Hyundai thefts. The steel blue presents a stable contrasting background for "other" thefts, while effectively demonstrating the disproportionate theft rate for Kia/Hyundai. We used neutral grays for the background elements to keep focus on the data.
- **Text:** Titles are bold and direct and will communicate the point. Attributions and annotations are clear, concise, and appropriately placed to provide the viewer with necessary context without cluttering the visual. We chose fonts that are most readable to the viewer, depending on the mode of digital presentation.
- **Alignment & Spacing:** Alignment and spacing measures ensure that all visual elements are logically aligned via some level of emphasis or relation through proximity. Because of this clutter-free layout, relationships show visually similar data types together, even with complex information. The space may also eliminate visual fatigue by notifying the viewer about a vital insight to note.

- **Sizing:** The key data labels we chose to highlight in larger text or through some other more distinct visual treatment (for sake of size), like high peak theft numbers and high percentage increases, to get the viewers' attention.
- **Visuals:**
    - **Stacked Area Chart (Milwaukee):** Effectively uses the Gestalt principle of continuity to show the dramatic and continuous shift in theft composition over time, with Kia/Hyundai thefts rapidly dominating.
    - **Stacked Bar Chart (Top 5 Cities):** Employs the principle of similarity (color coding) and common region (bars grouped by city) to allow for quick comparison of theft types across different urban areas, highlighting the widespread nature of the problem.
    - **Donut Chart (Chicago Peak):** While a pie/donut chart can sometimes be less precise for comparisons, it is used to powerfully illustrate the overwhelming proportion of Kia/Hyundai thefts during a peak period in a single, highly affected city. The precise segmentation and direct percentage labels make the imbalance immediately apparent.
    - **Treemap (Overall Kia/Hyundai Thefts):** Utilizes size and color intensity to represent the magnitude of Kia/Hyundai thefts by city, allowing for rapid identification of major hotspots. The principle of enclosure helps group related cities.
    - **Geographic Map (Percent Change):** Leverages color gradients and point sizing to visually represent the spatial distribution and intensity of car theft changes across the US, quickly showing areas with significant increases (red) or decreases (blue). This taps into the principle of common fate, as regions with similar changes are visually linked.
    - **Line Chart (Monthly Percentage):** Demonstrates trends over time for selected cities, allowing for direct comparison of how the percentage of Kia/Hyundai thefts evolved in

different locations. The use of distinct colors for each municipality aids differentiation (similarity).

Ethical Considerations

- **Data Changes:** The primary data source, Motherboard_VICE_News_Kia_Hyundai_Theft_Data_Cleaned.csv, was used to prepare Kia_Hyundai_Thefts and the All_Thefts. The countOtherThefts column was created by subtracting Kia_Hyundai_Thefts from All_Thefts. The NAs in All_Thefts or Kia_Hyundai_Thefts were addressed by filtering out instances where All_Thefts was NA or 0, because they would yield meaningless percentage calculations. The process of transforming the data is thoroughly documented, and we have not changed or altered the original numbers reported; we have been able to reshape them for comparative use.
- **Legal or Regulatory Guidelines:** The data we used is summarized and publicly available, often from police departments and in news reports. There are no legal or regulatory guidelines that we have potentially violated in using or displaying the data, since we do not reveal any individuals or personally identifiable information.
- **Risks Created by Presentation**:
    - **Alarmism:** The contrasting colors (red for Kia/Hyundai) and the emphasis on increasing trends may create fear or alarm for owners.
    - **Misunderstanding:** People may view the data as all Kia/Hyundai vehicles are easy to steal, versus one of the specific vehicles/one lacking certain security features.
    - **Victim Blaming:** There may be an implicit suggestion that it is the owners' fault for not adequately securing their vehicles, more so than focusing on the risk the manufacturers created through the vehicles' inbuilt capability.

    - **Brand Impact:** The presentation could be detrimental to the Kia/Hyundai brands as a whole and potentially diminish or damage sales or the desire to locate or wait for avenues by members of the public.

- **Assumptions:**
    - It is presumed that the data provided (KiaHyundaiMilwaukeeData.csv, carTheftsMap.csv, KiaHyundaiThefts.csv, Motherboard_VICE_News_Kia_Hyundai_Theft_Data_Cleaned.csv) faithfully represent the underlying police and news data.
    - For the treemap and geographic map, a threshold (total_thefts > 1000 or abs(percentChange2019to2022) > 0.5) was applied to restrict the cities in the visualization for simplicity. As a result, other cities have fewer thefts or where the percent change is not as drastic, which are not shown in these visualizations, but this filtering is noted.
- **Data Sourcing/Credibility:** Data is obtained from police departments (as presented in the Motherboard/VICE News report) and other bases of aggregated public information. The source (Motherboard/VICE News) is a reliable journalistic outlet; still, the ultimate reliability of the data relies on the accuracy of police data. The data is conveyed as reported by these sources.
- **Ethical Acquisition:** The data appears publicly available and is aggregated; thus, we can conclude it has been ethically acquired. No private, personal, or sensitive data was accessed or utilized.
- **Mitigation of Ethical Implications:**
    - **Context:** The report (this document) provides essential context in addition to summarizing "why" the thefts happened (vulnerability) as opposed to just the "what".

- **Equal Opportunity & Balanced Narrative:** The issues raised by the report provide equal opportunity to visualize the problem as a liability that needs to be addressed, while the call to action emphasizes solutions and the shared responsibility of stakeholders (manufacturers, government, and owners) in collective action.
- **Defined Expectations:** All charts/maps are titled and described for clarity in interpretation.
- **Trends Not Numbers:** The visualizations are designed with trends and proportions in mind, not isolated circumstances; thus, providing the reader with a more holistic understanding of the data.
- **Empowerment:** The call to action is prompted by a focus on empowering individuals and institutions to care for the problem, and less on blame, through action.