



VIS2024

FishBiasLens

Integrating LLMs and Visual Analytics for Bias Detection

Dany Diaz, Felipe Moreno-Vera, Juanpablo Heredia, Fabrício Venturim, Jorge Poco

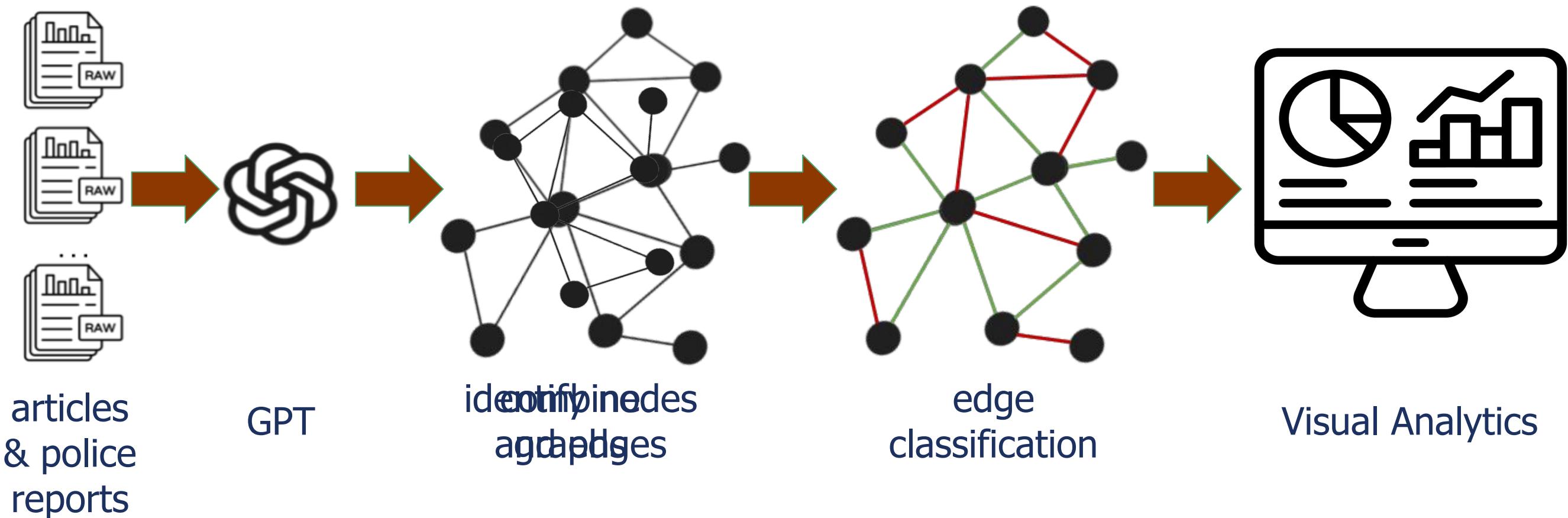


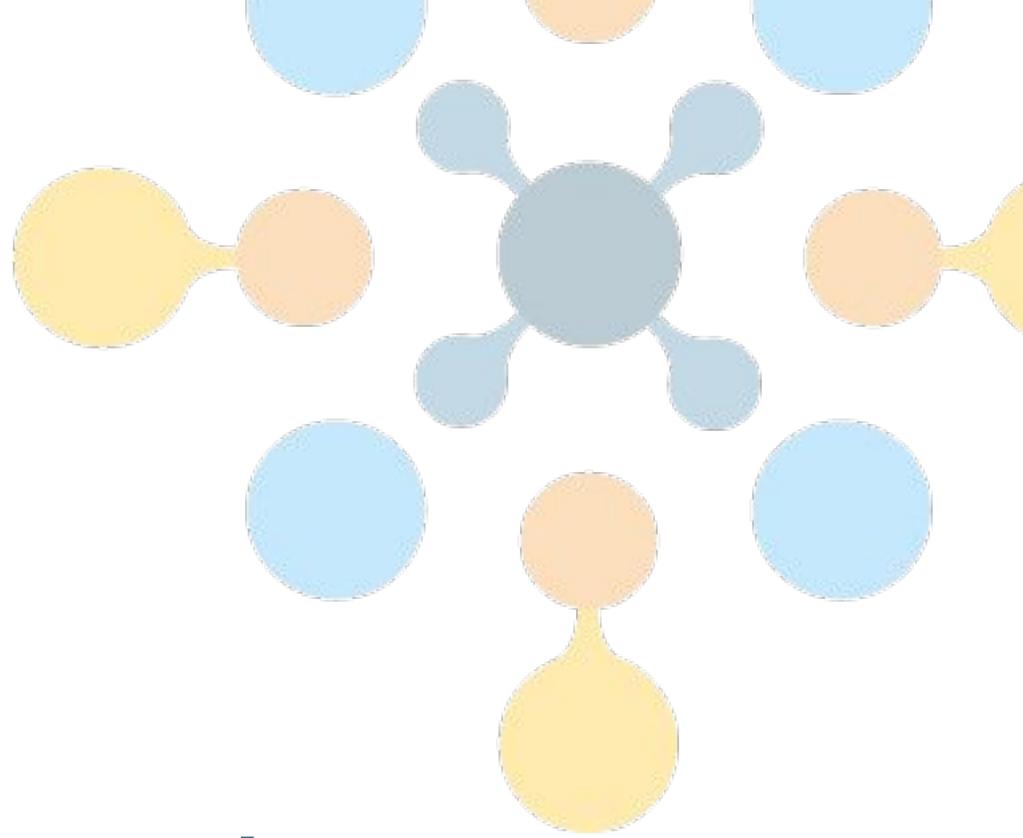
Fundação Getulio Vargas / Visual Data Science Lab

www.visualdslab.com

Key points

- Methodology to extract information from texts using LLMs.
- Visual analysis.



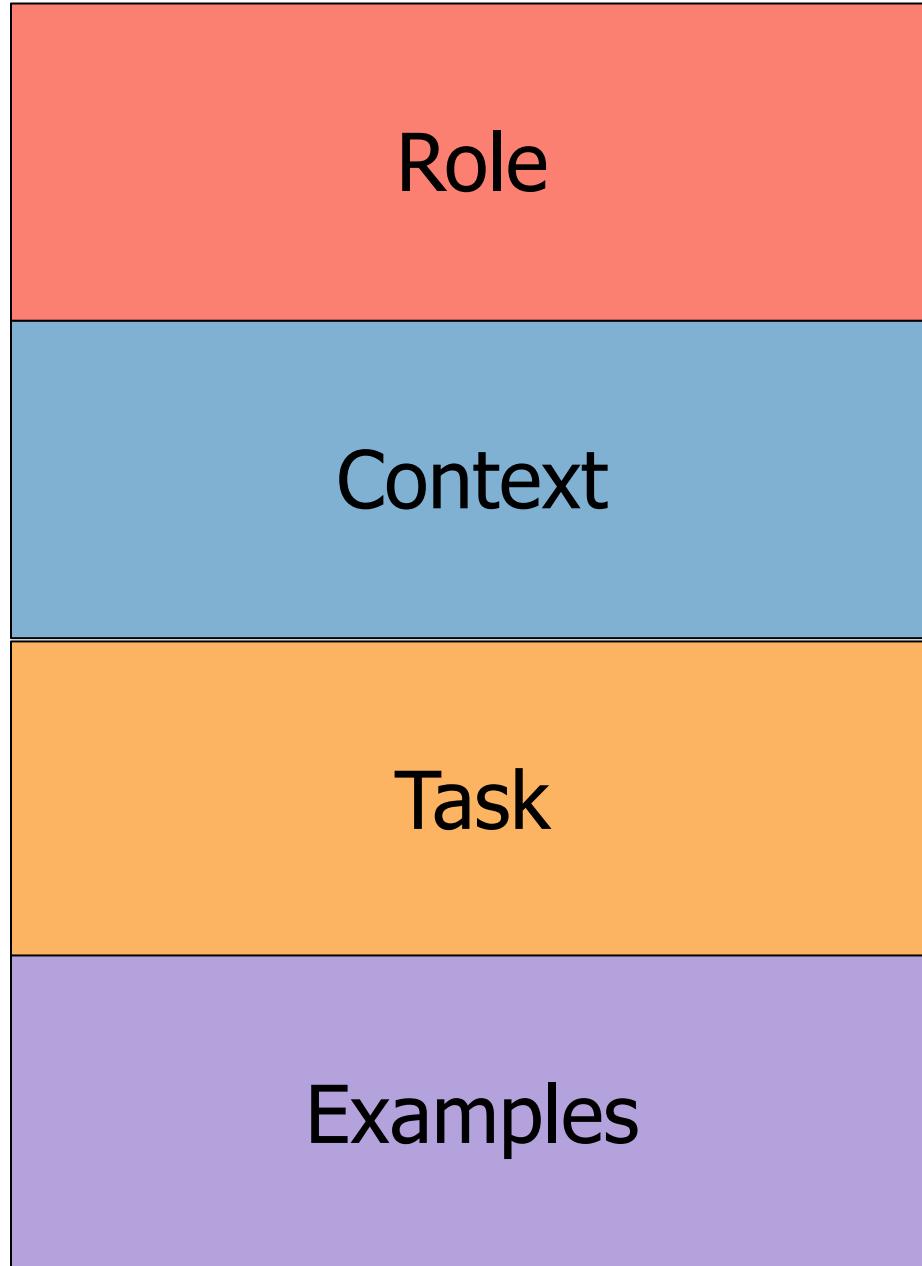


LLMs for information extraction

Methodology for information extraction

- Prompting.
- Few-shot learning.
- Edge classification.

Prompt structure



Role: *"You are an textual information extraction assistant."*

Edges: List of possible events, opinions or discussions.

Nodes type-1: *companies, logistic companies, and fishing companies.*

Nodes type-2: *Gov, non-gov entities, organizations, locations, and commodities.*

(source, event, target)

FEW-SHOT LEARNING

Simple examples

Complex examples

Few-shot learning: Simple example

Marine Sanctuary Aid Boosts Alvarez PLC's Sustainable Fishing Efforts

In recent years, Alvarez PLC has emerged as a leading force in sustainable fishing, spearheading efforts to preserve marine ecosystems while maintaining profitable operations. The company's dedication to innovation and collaboration has garnered attention, with a string of successful transactions and investments solidifying its position in the industry.

Since the beginning of the year, Alvarez PLC has been actively engaged in bolstering its sustainable practices. Notably, the company has made strategic investments in efficiency and safety commodities, underscoring its commitment to responsible fishing practices. With a keen eye on the future, Alvarez PLC has also prioritized the development of sustainable nets and tracking systems, further enhancing its environmental stewardship.

Collaboration has been key to Alvarez PLC's success, as evidenced by its participation in conferences alongside industry peers. Recent engagements with Clements, Allen and Sullivan, as well as Franco-Stuart, have facilitated knowledge exchange and fostered new ideas for sustainable fishing techniques.

Moreover, Alvarez PLC's dedication to marine conservation extends beyond its own operations. The company has actively supported marine sanctuary initiatives, providing aid to preserve vital ecosystems. This commitment to environmental protection underscores Alvarez PLC's role as a responsible corporate citizen.

Fishing activities primarily take place in designated areas such as Himark and Centralia, where Alvarez PLC operates with a focus on sustainability. By leveraging technological advancements and strategic partnerships, the company continues to thrive in its mission to balance economic viability with environmental preservation.

Weather trends play a crucial role in fishing operations, and Alvarez PLC remains vigilant in monitoring and adapting to changing conditions. With a proactive approach to risk management, the company navigates through challenges while ensuring the sustainability of its practices.

Recent transactions reflect Alvarez PLC's robust engagement in the market, with a diverse portfolio of partnerships and acquisitions. From collaborations with Barnett Ltd and Cain, Simpson, and Hernandez to transactions with Maldonado, Sanchez, and Jones, and Johnson-Johnson, Alvarez PLC continues to expand its influence while upholding its reputation as a reputable and respected entity in the fishing industry.

As Alvarez PLC looks to the future, its unwavering commitment to sustainable fishing practices serves as a beacon of hope for the preservation of marine ecosystems worldwide. Through innovation, collaboration, and responsible stewardship, the company sets a precedent for sustainable development in the fishing industry.

Marine Sanctuary Aid Boosts Alvarez PLC's Sustainable Fishing Efforts

Output:

(Alvarez PLC, Event.Aid, Marine Sanctuary)

source

event

target

Few-shot learning: Complex example

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Fishing activities primarily take place in designated areas such as Himark and Centralia, where Alvarez PLC operates with a focus on sustainability...

Outputs:

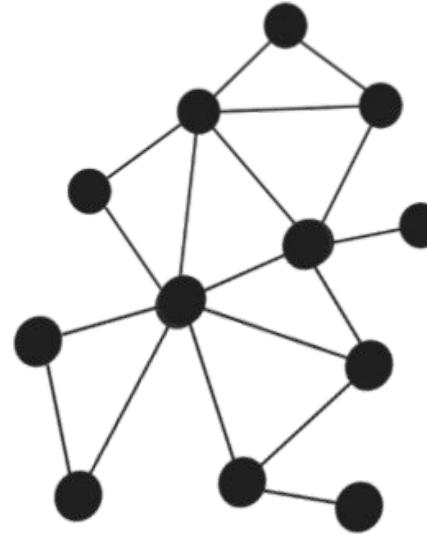
(City of Himark, Event.CertificateIssued, Alvarez PLC),
(City of Centralia, Event.CertificateIssued, Alvarez PLC),
(Alvarez PLC, Event.Invest, sustainable_nets)

source

event

target

Information identified: Summary



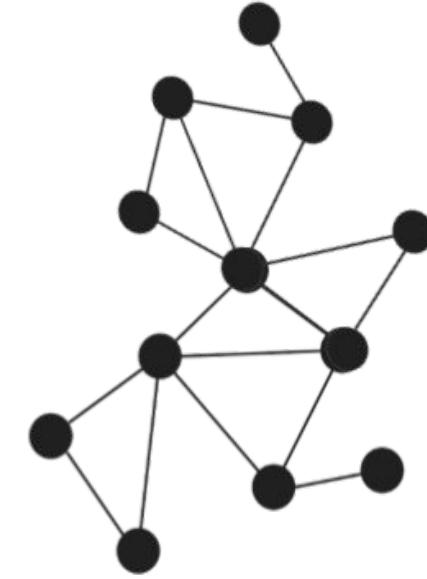
Ours

2,818 edges (7 types)
170 nodes



BassLine

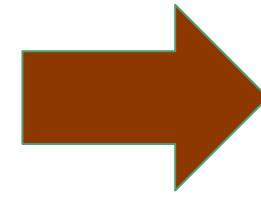
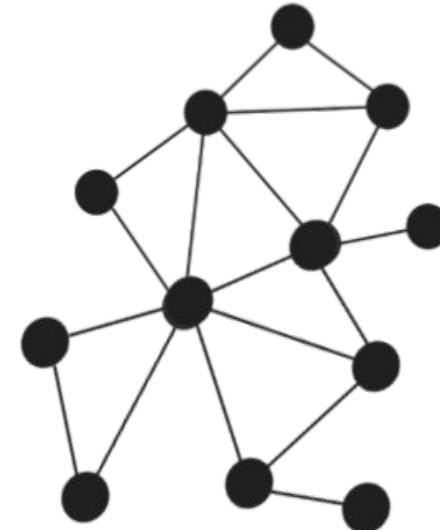
7,294 edges (12 types)
197 nodes
2,435 in common



ShadGPT

6,906 edges (12 types)
197 nodes
2,298 in common

Information identified: The new analyst Felipe



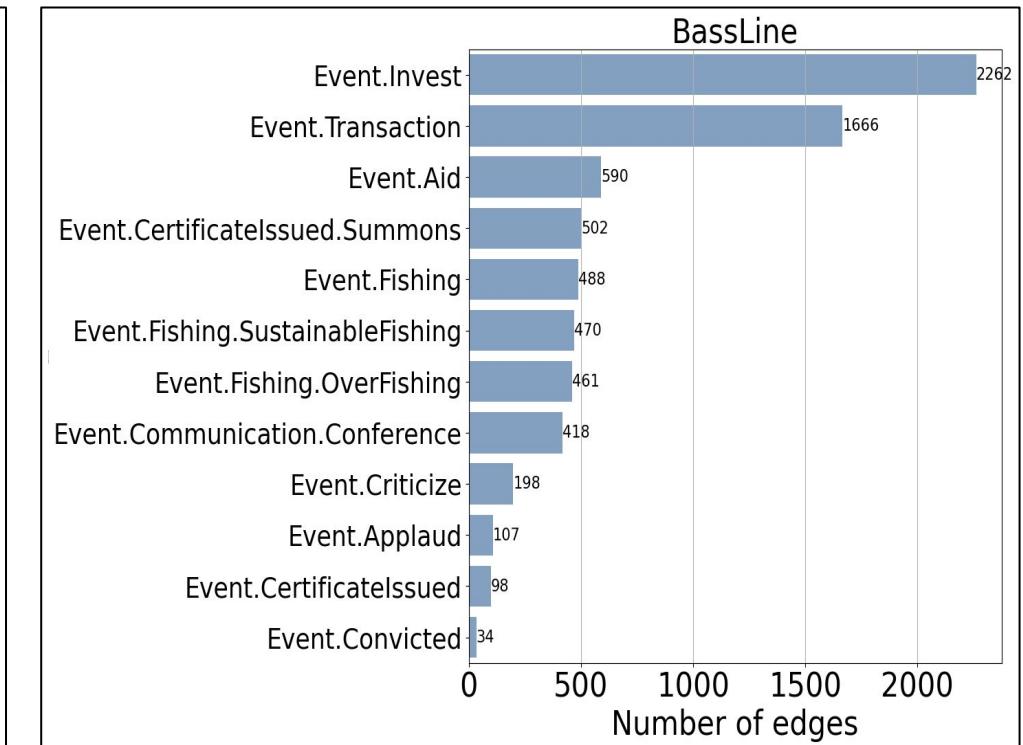
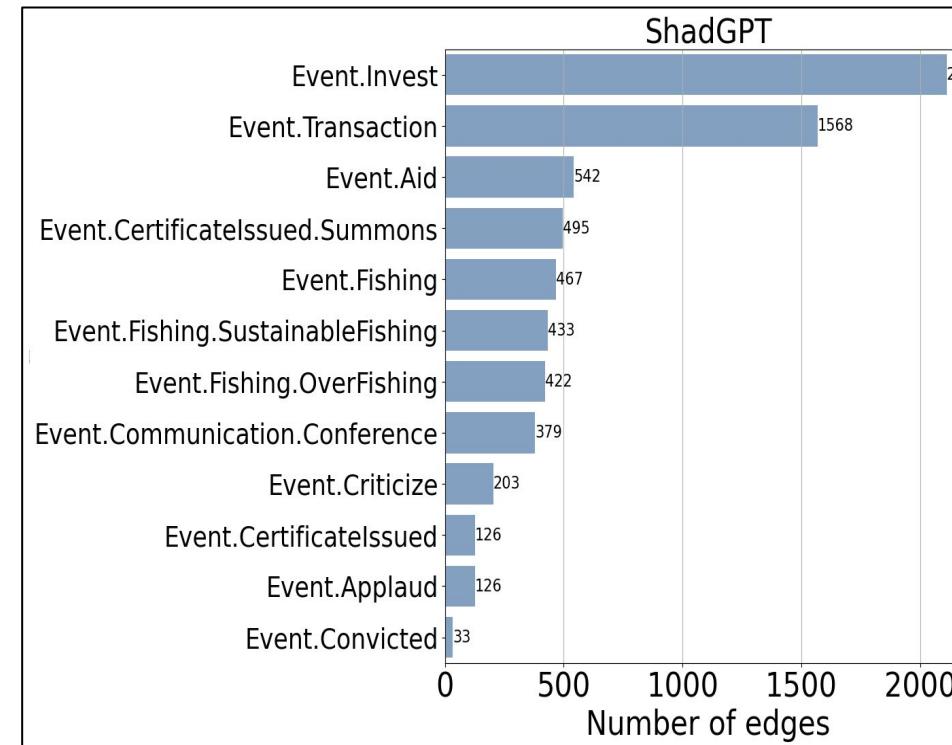
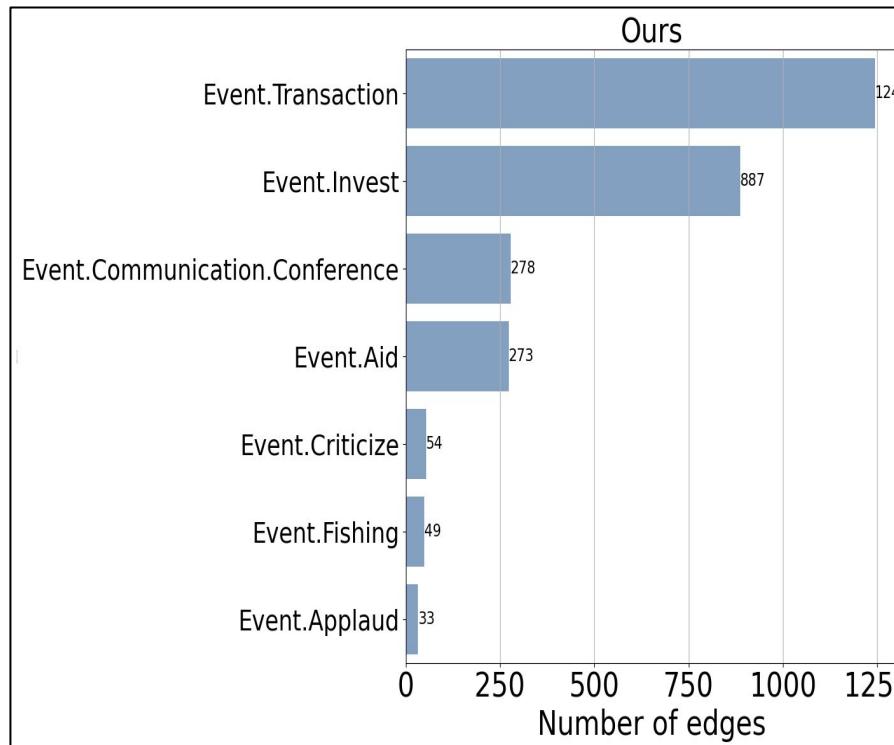
Ours

2,818 edges (7 types)
170 nodes

New analyst called “Felipe”.

Who added 2,818 edges.

Information identified: Edges



Ours

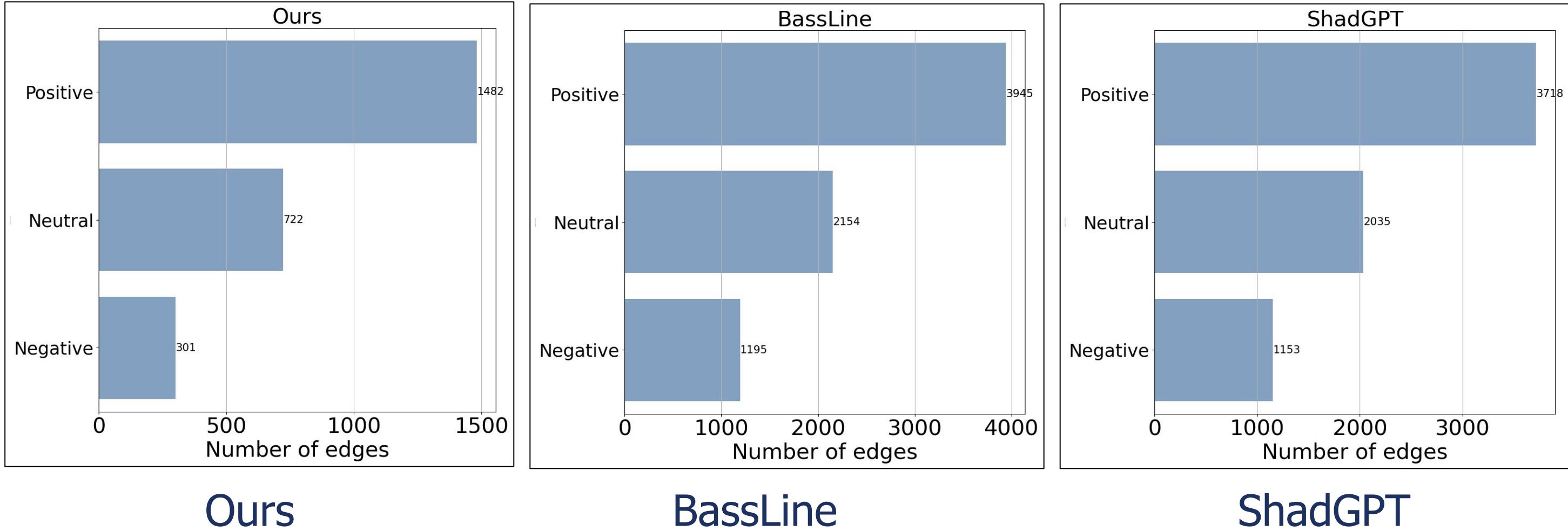
BassLine

ShadGPT

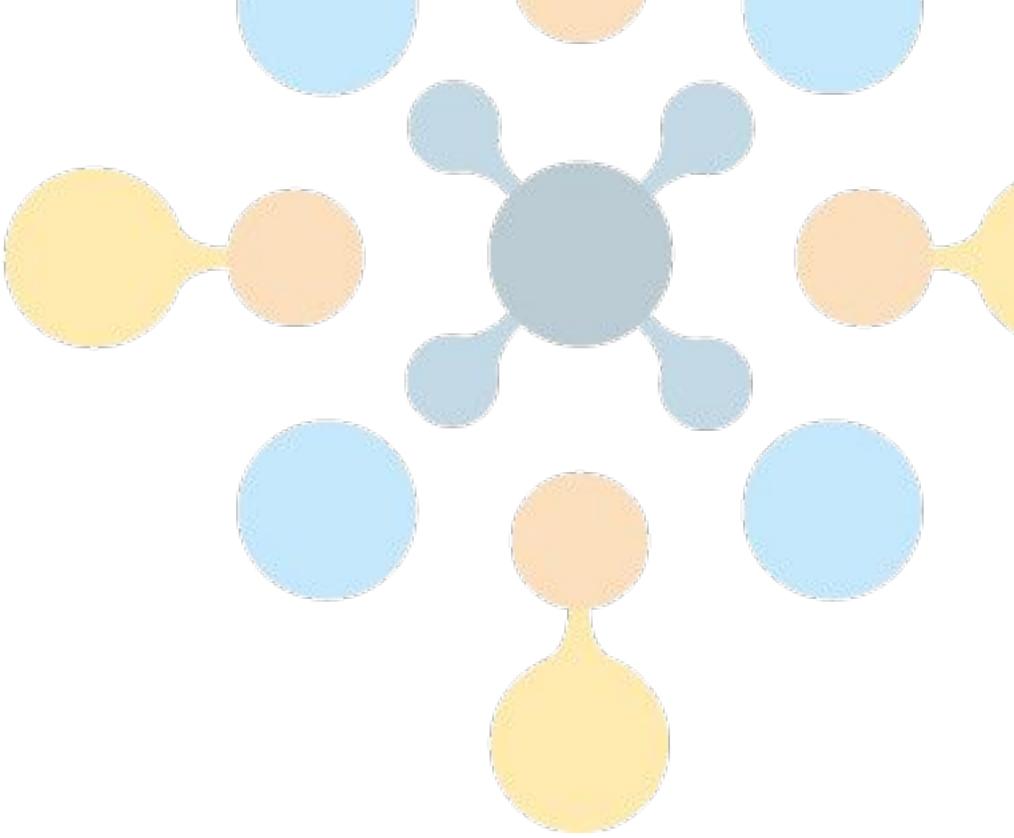
Edge classification

- **Positive (weight +1)**
Invest, Aid, Fishing, SustainableFishing, Applaud, CertificateIssued.
- **Neutral (weight 0)**
Conference, Transaction, PartiallyOwns.
- **Negative (weight -1)**
OverFishing, Criticize, Summons, Convicted.

Edge classification



Journal Bias

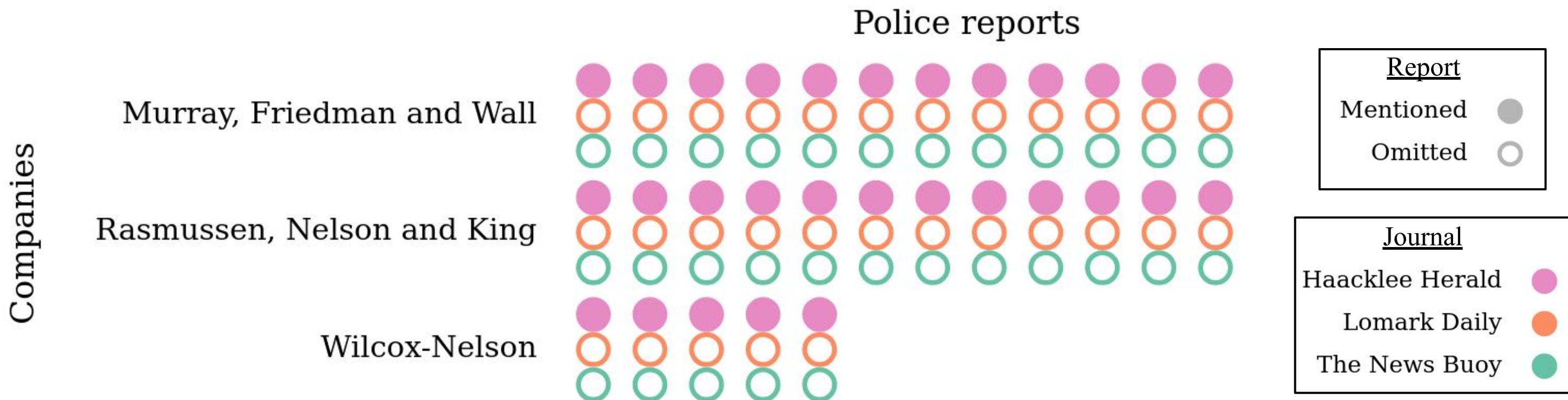


Findings

- Some journals omitted police reports.
- **Lomark Daily** and **The News Buoy** may be biased.
- Possible bias favoring Conti Family.

Omitted police reports

We manually checked if the police reports were mentioned by journals.



Omitted police reports

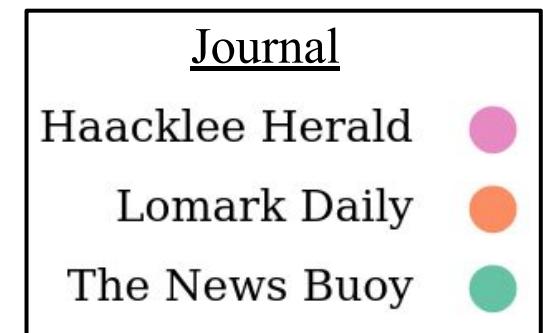
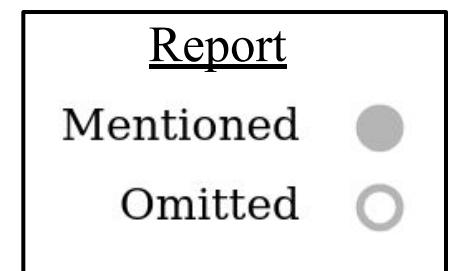
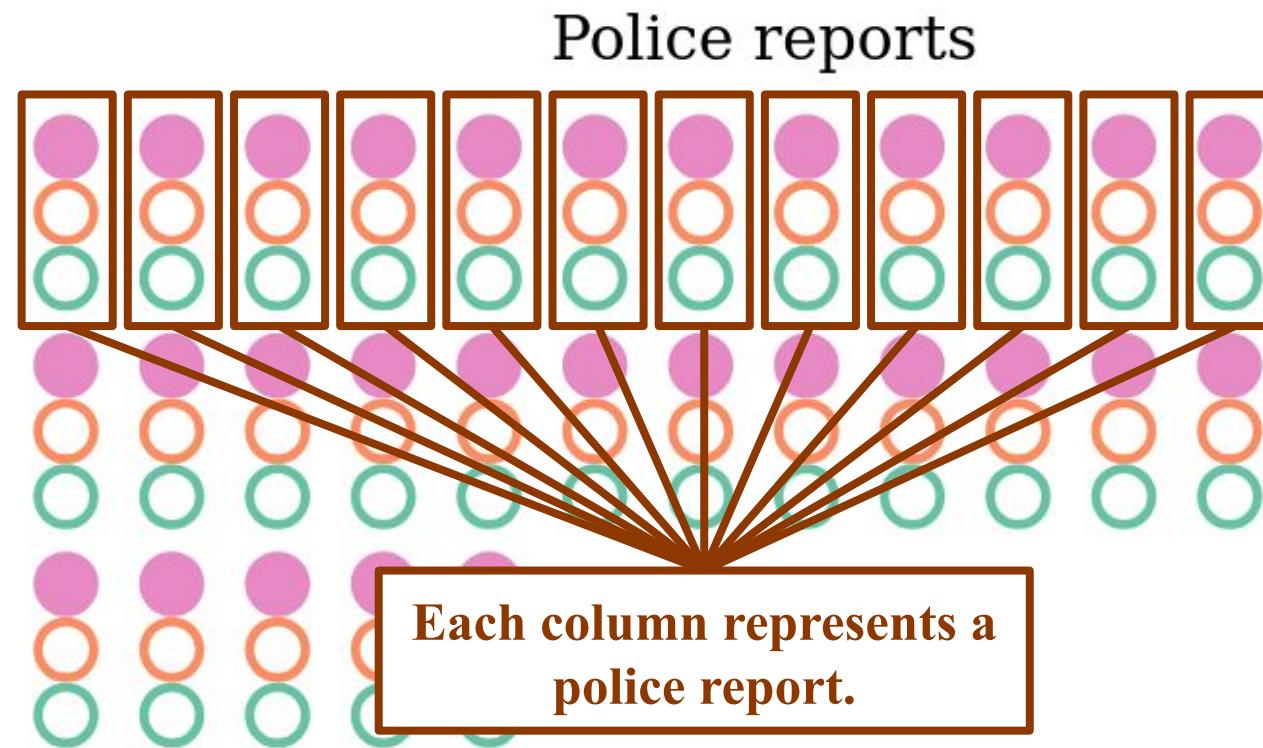
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Companies

Murray, Friedman and Wall

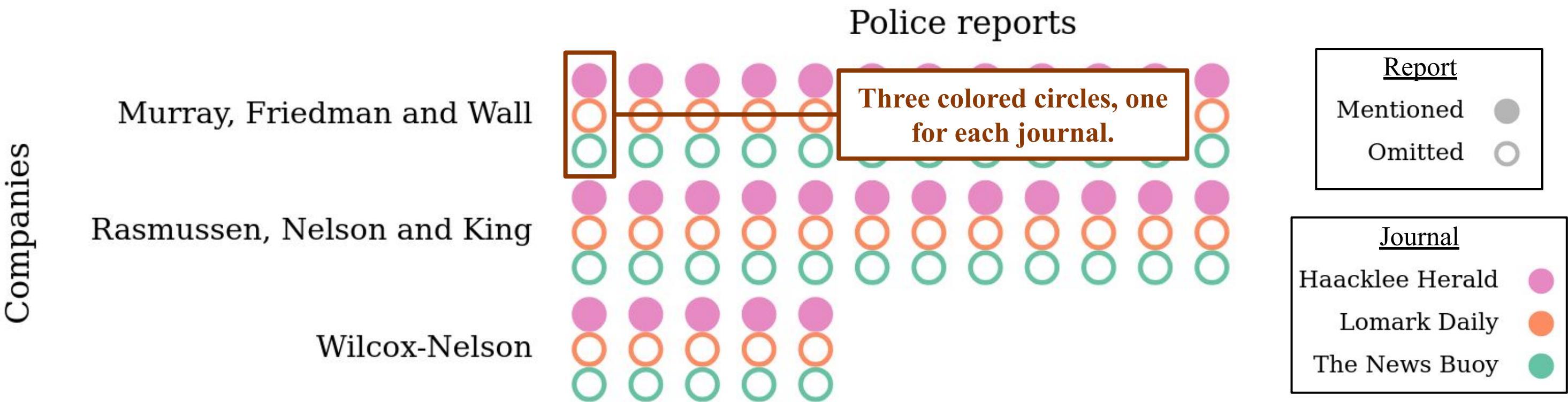
Rasmussen, Nelson and King

Wilcox-Nelson



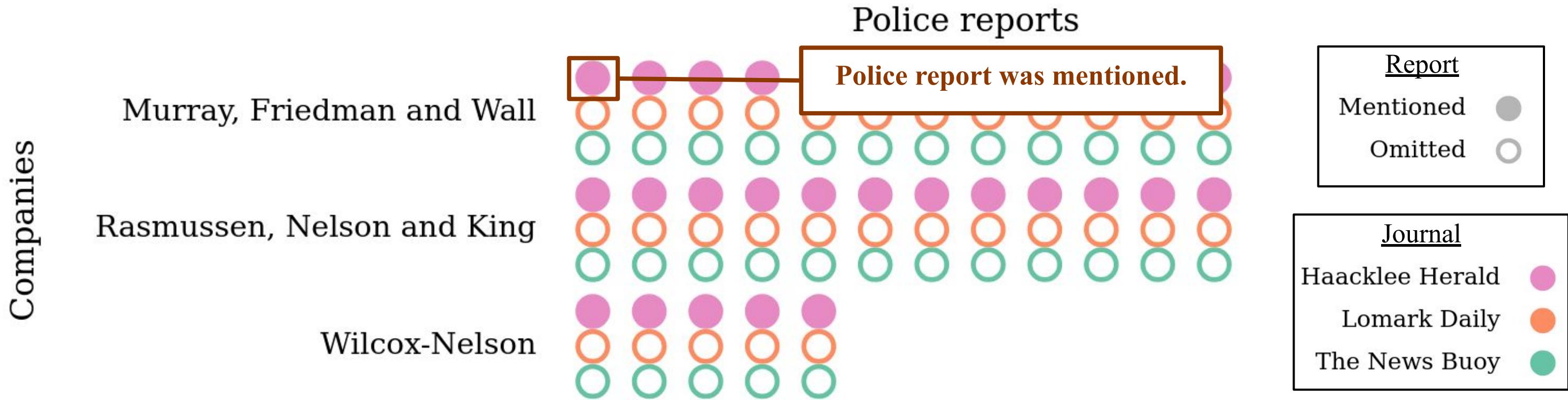
Omitted police reports

We manually checked if the police reports were mentioned by journals.



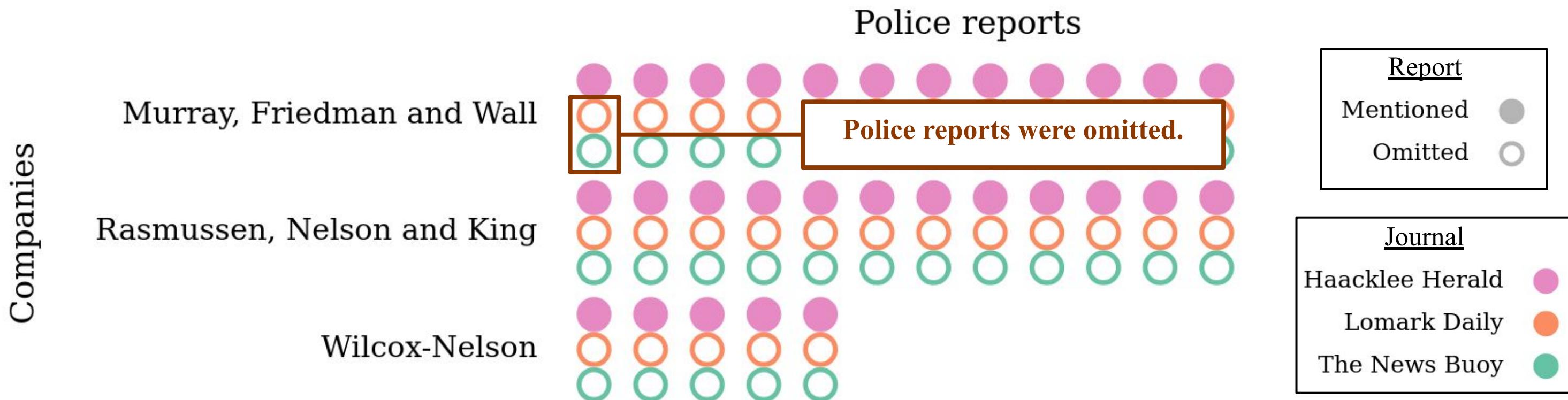
Omitted police reports

We manually checked if the police reports were mentioned by journals.



Omitted police reports

We manually checked if the police reports were mentioned by journals.



Omitted police reports

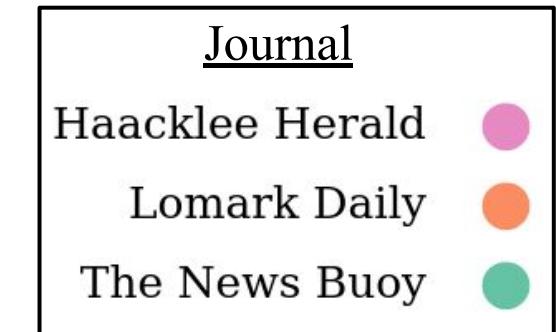
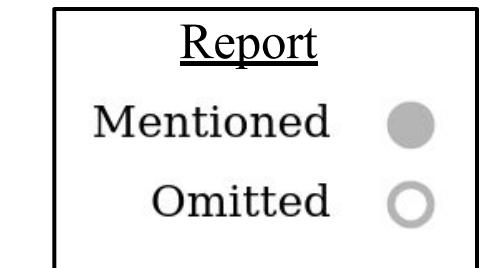
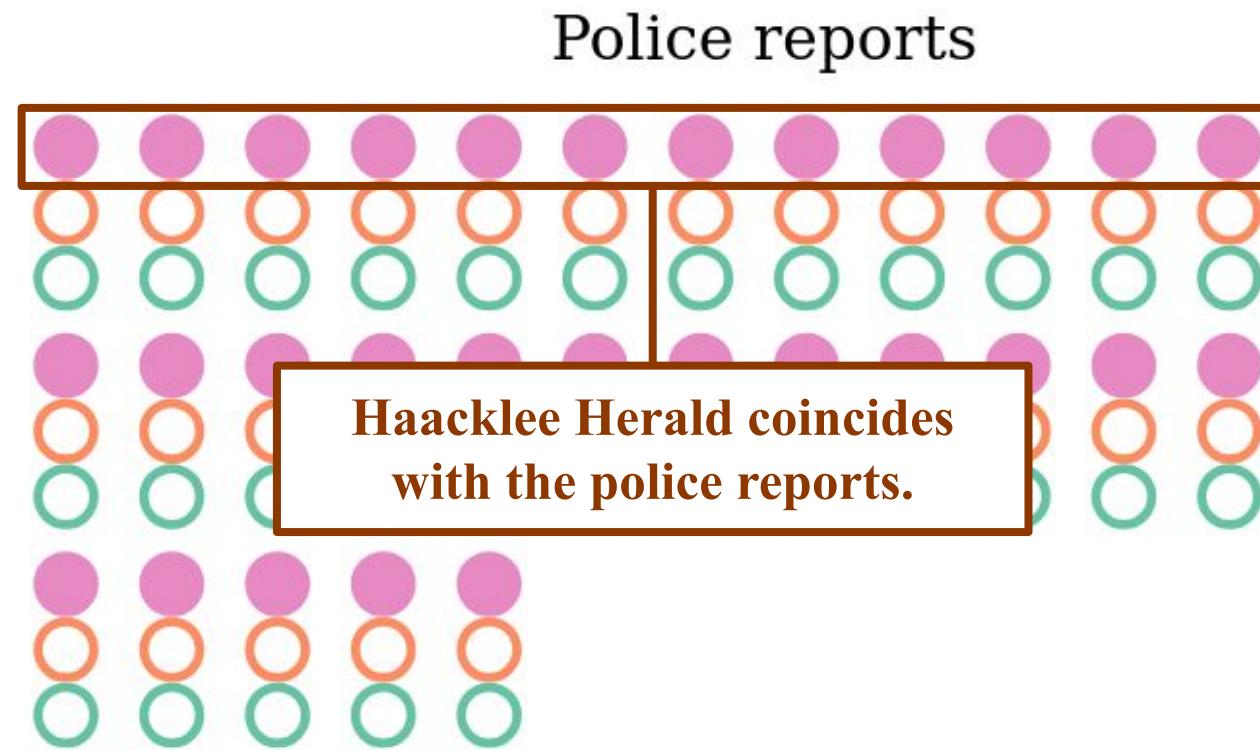
Lomark Daily and The News Buoy omitted police reports.

Companies

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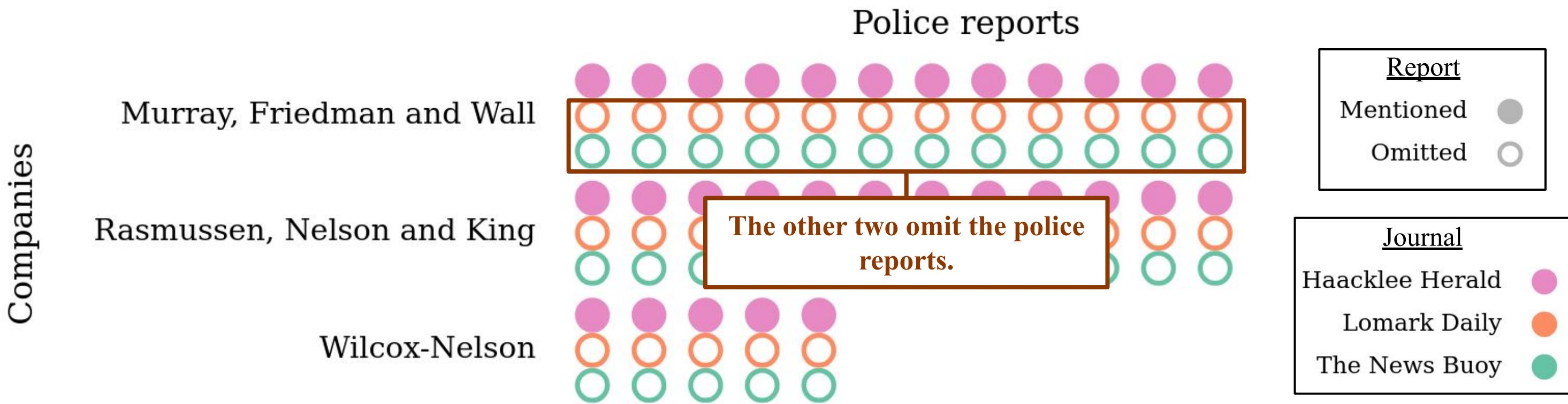
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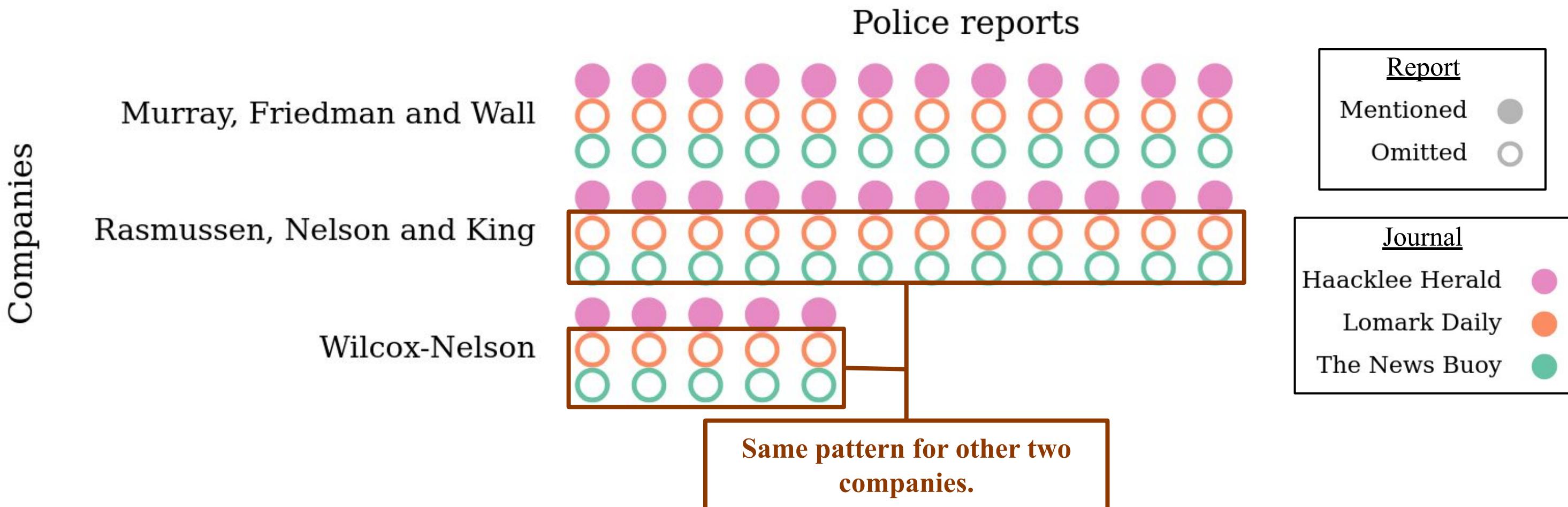
Omitted police reports

Lomark Daily and The News Buoy omitted police reports.



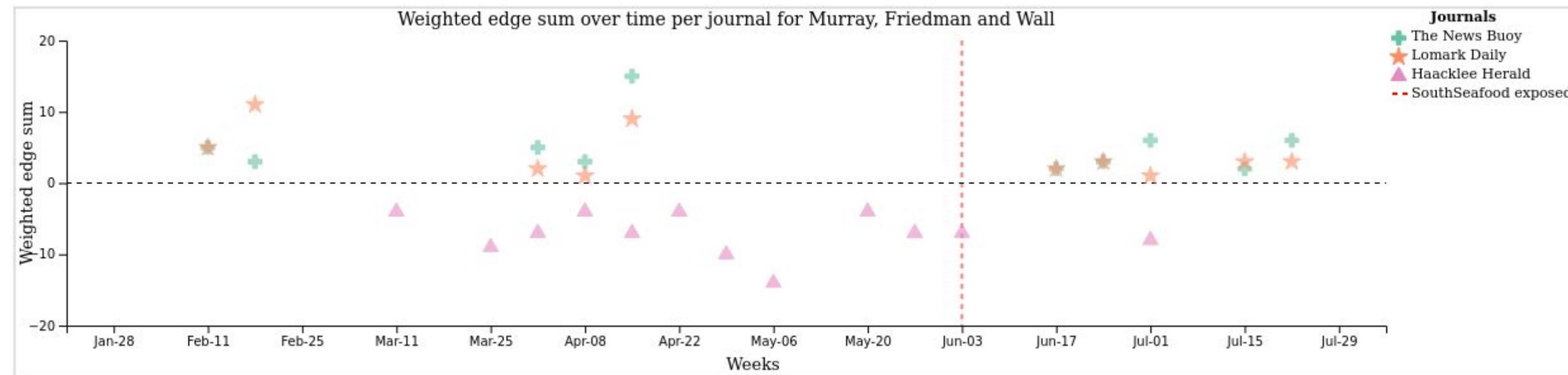
Omitted police reports

Lomark Daily and **The News Buoy** omitted police reports.



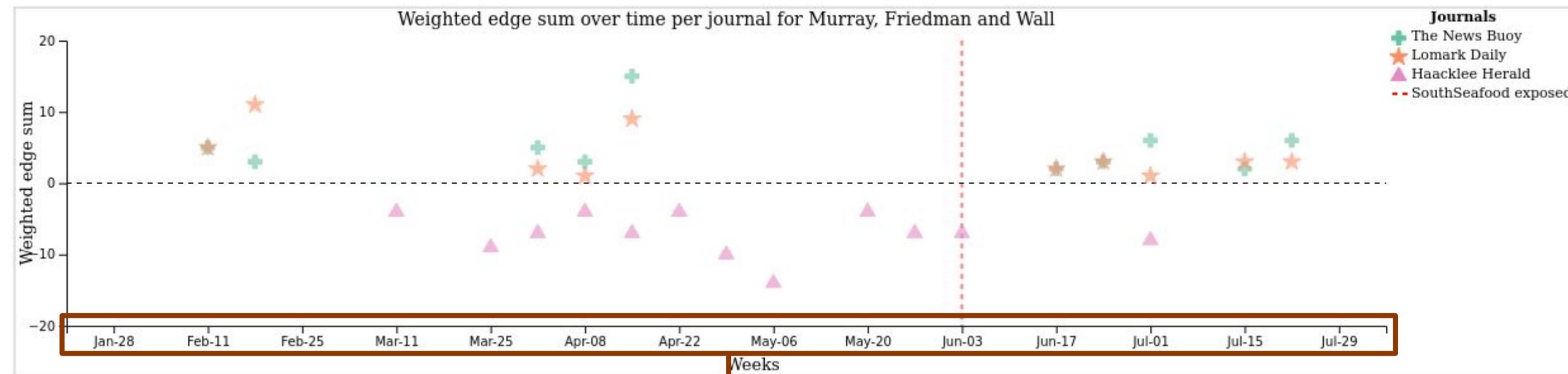
Lomark Daily and The News Buoy may be biased

Over time, those two journals reported only positive news.



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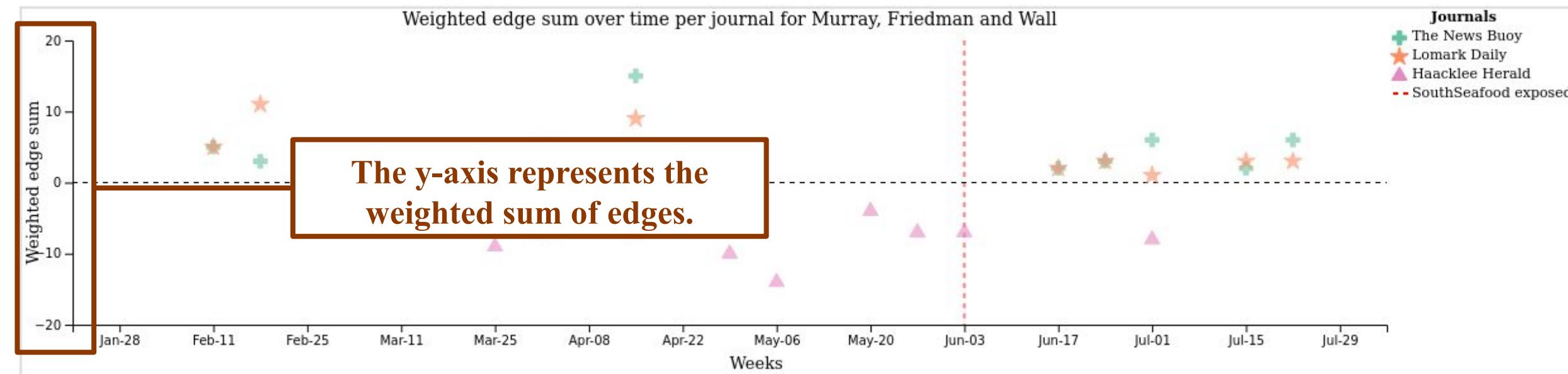
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The x-axis represents the temporal dimension.

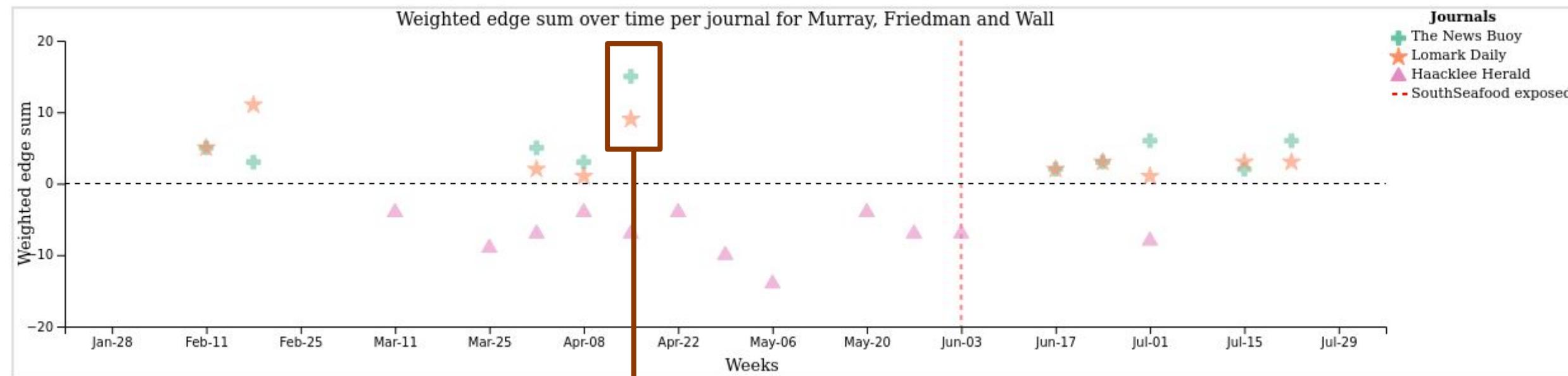
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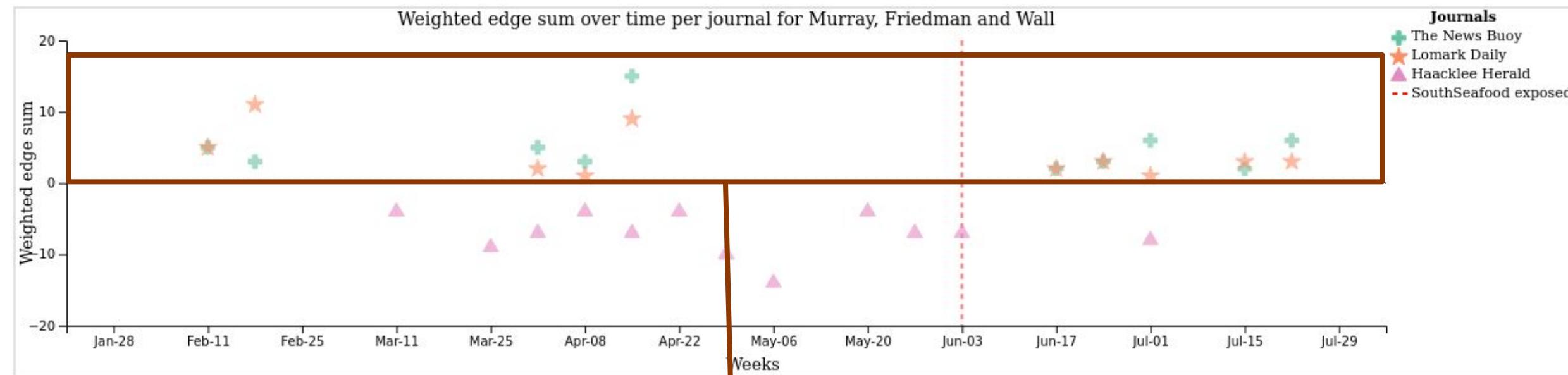
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Each mark is the sum of edges
by journal on that date.

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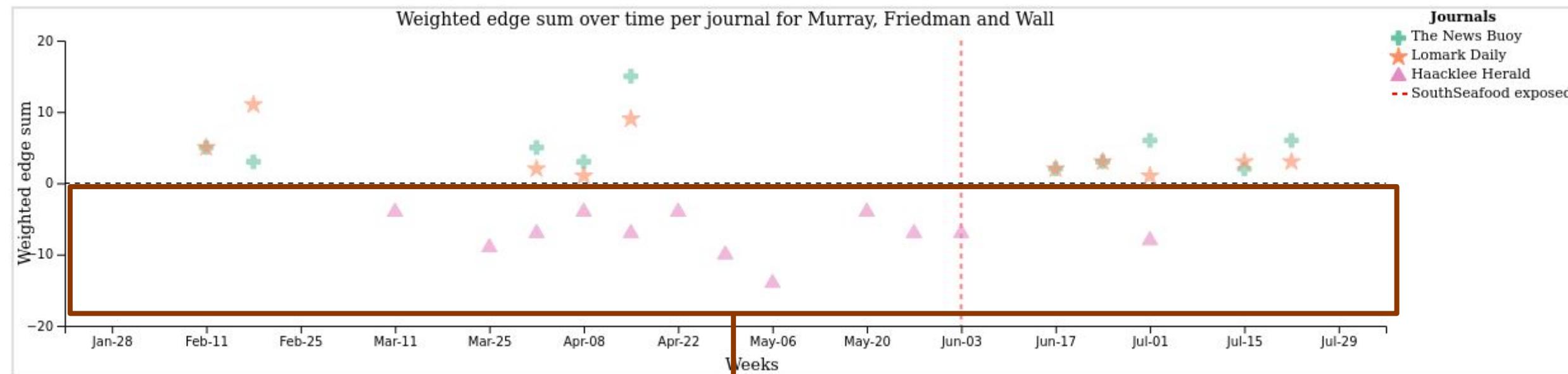
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Positive sums edges above the
x-axis.

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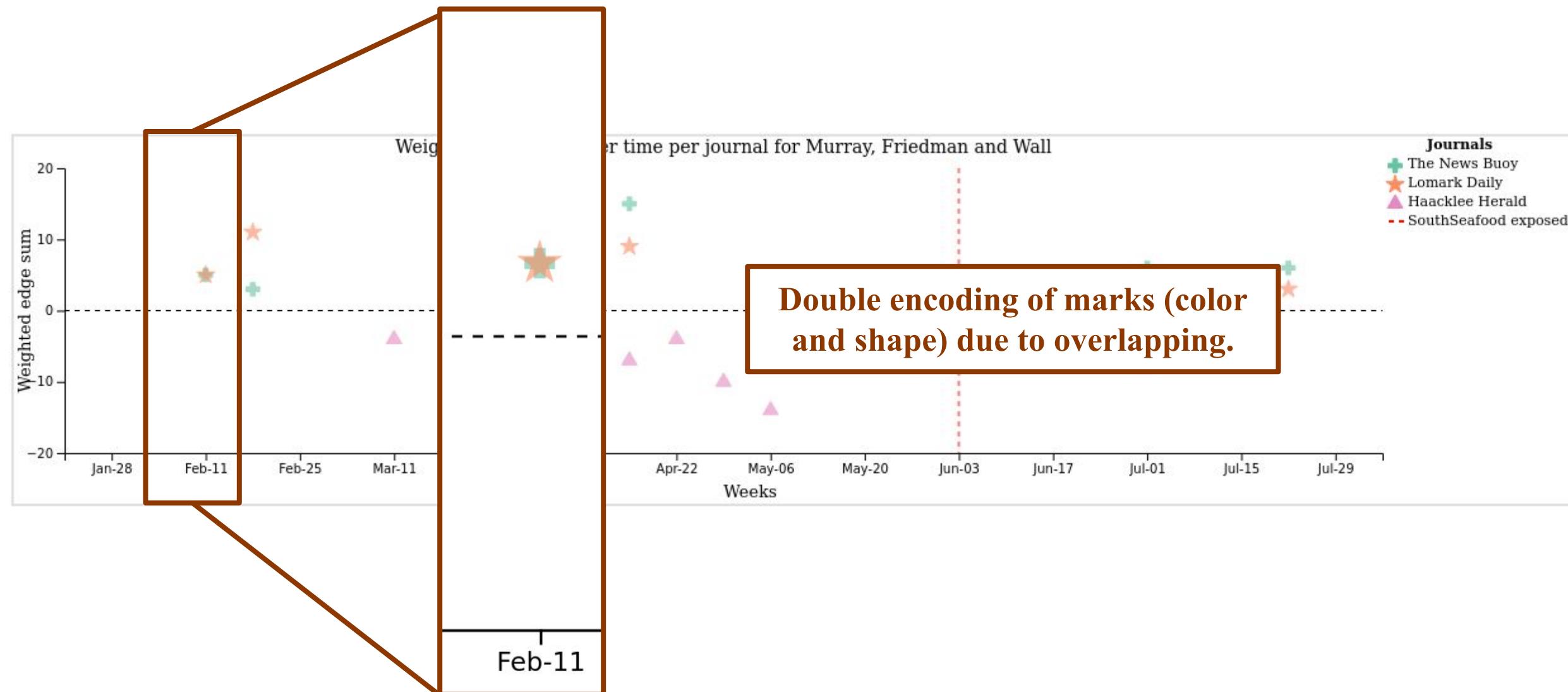
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Negative sums edges below the
x-axis.

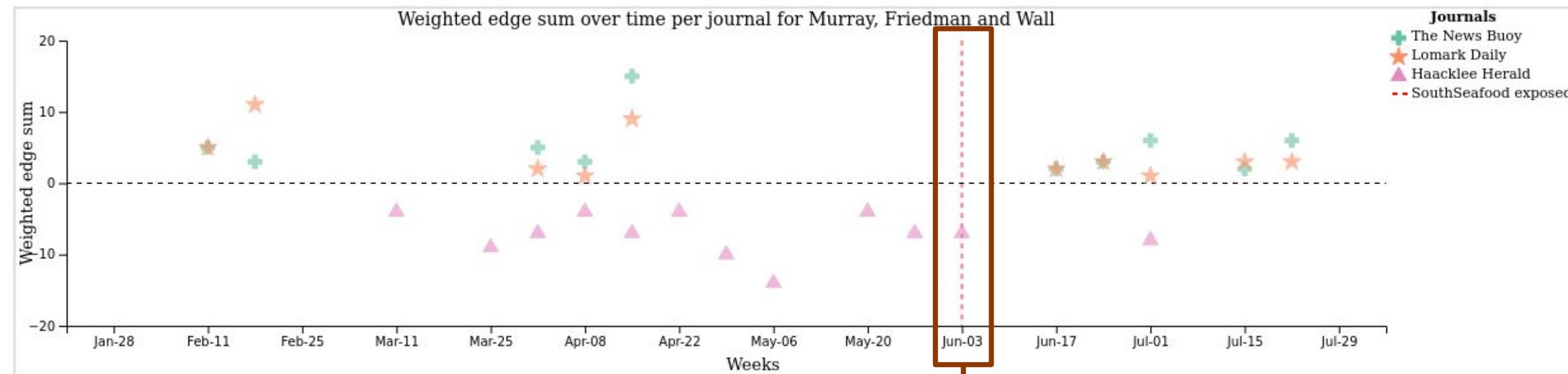
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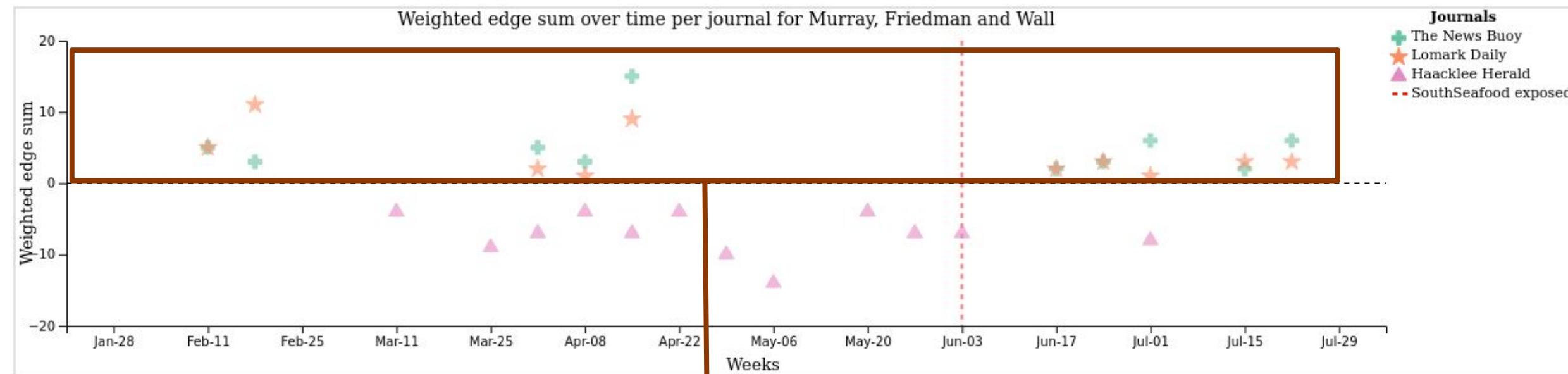
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Date of SouthSeafood incident.

Lomark Daily and The News Buoy may be biased

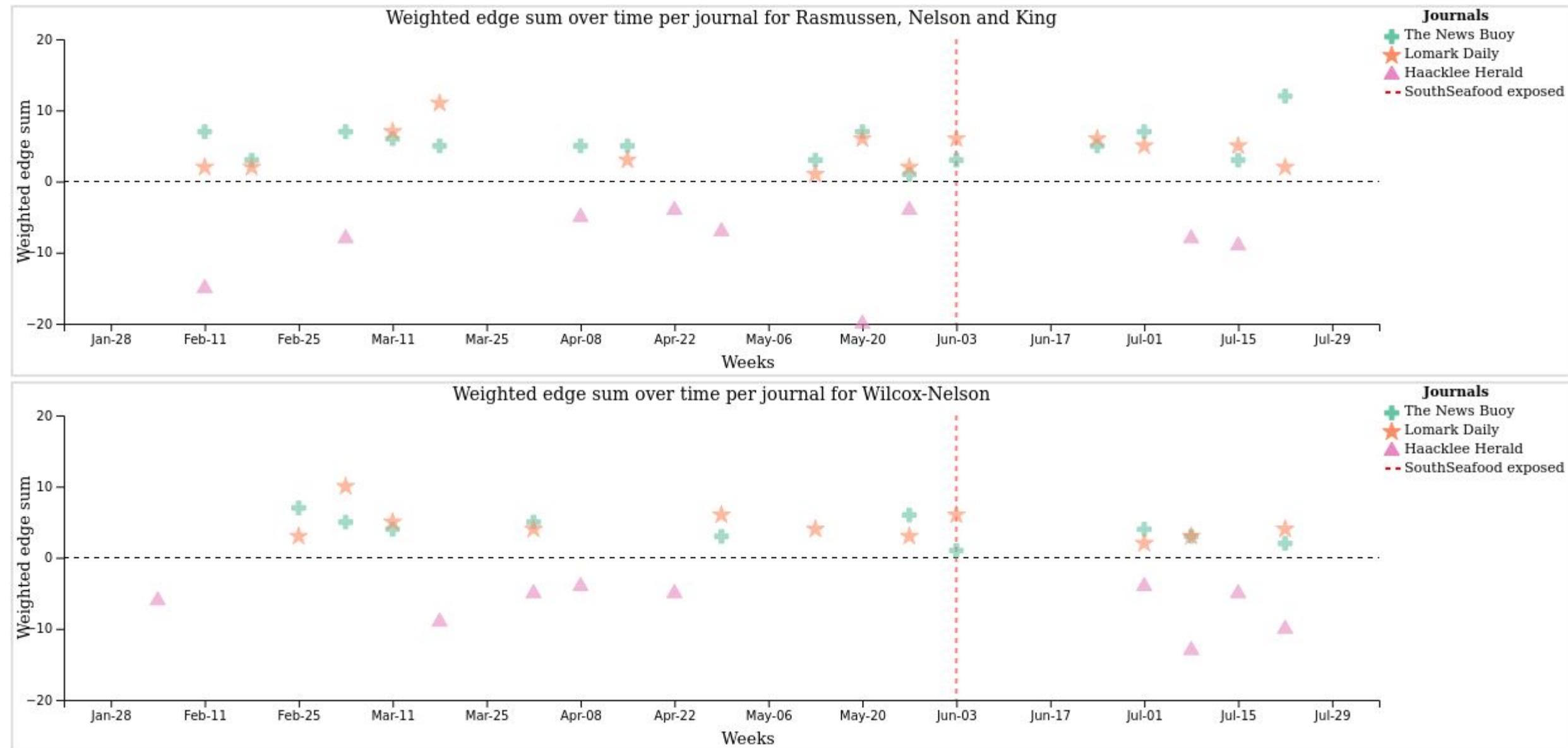
Over time, those two journals reported only positive news.



Only positive news reported.

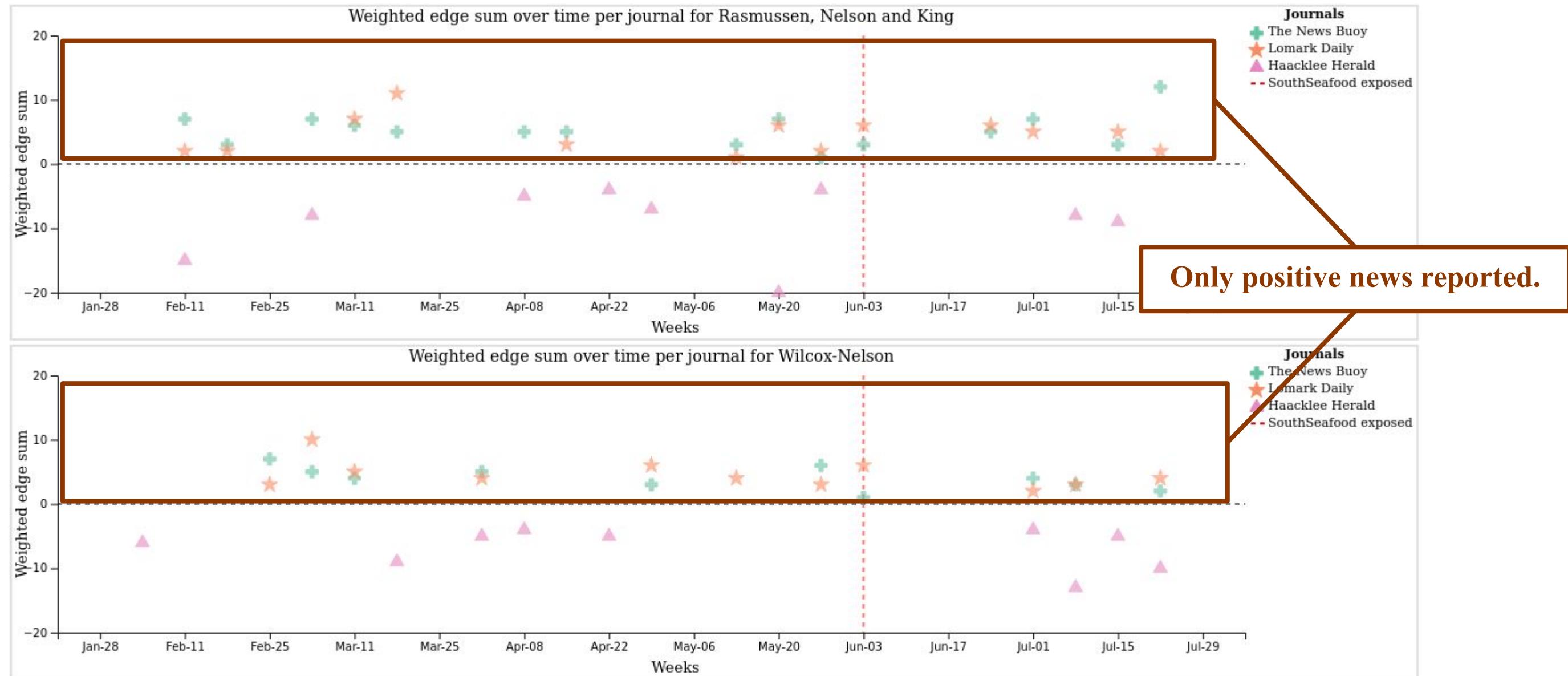
Lomark Daily and The News Buoy may be biased

Similar behavior for other two companies



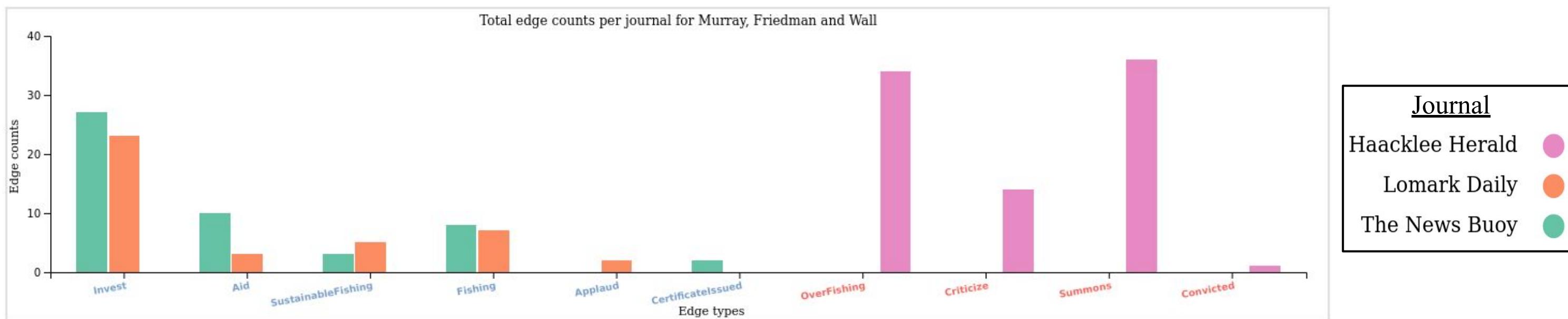
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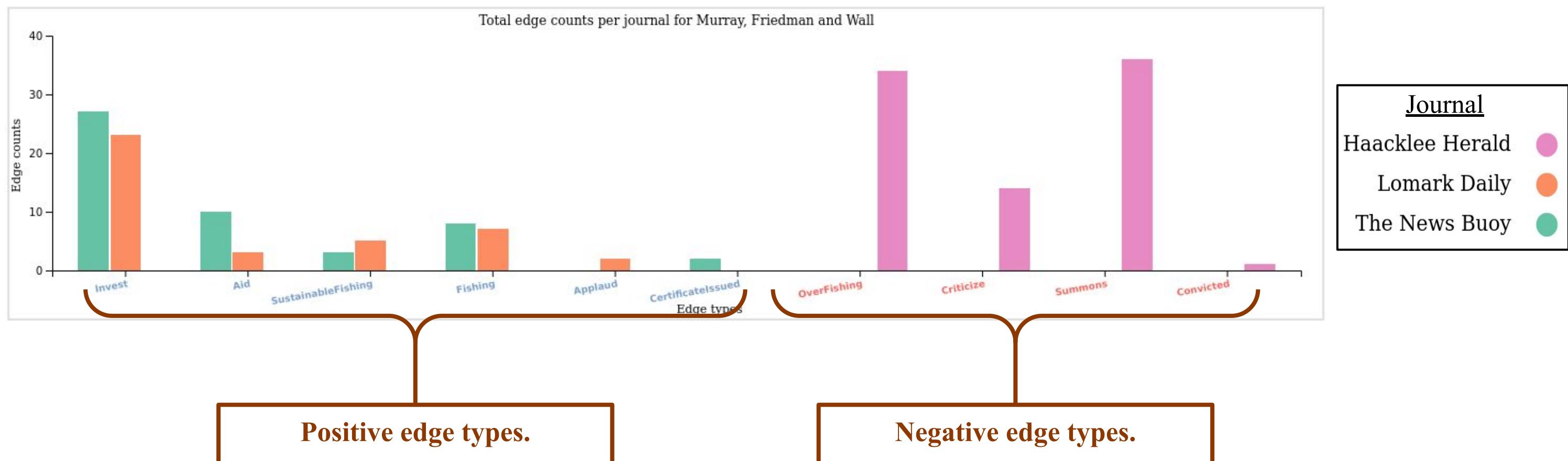
Lomark Daily and The News Buoy may be biased

Haacklee Herald reported the infractions. Other journals reported only positive news.



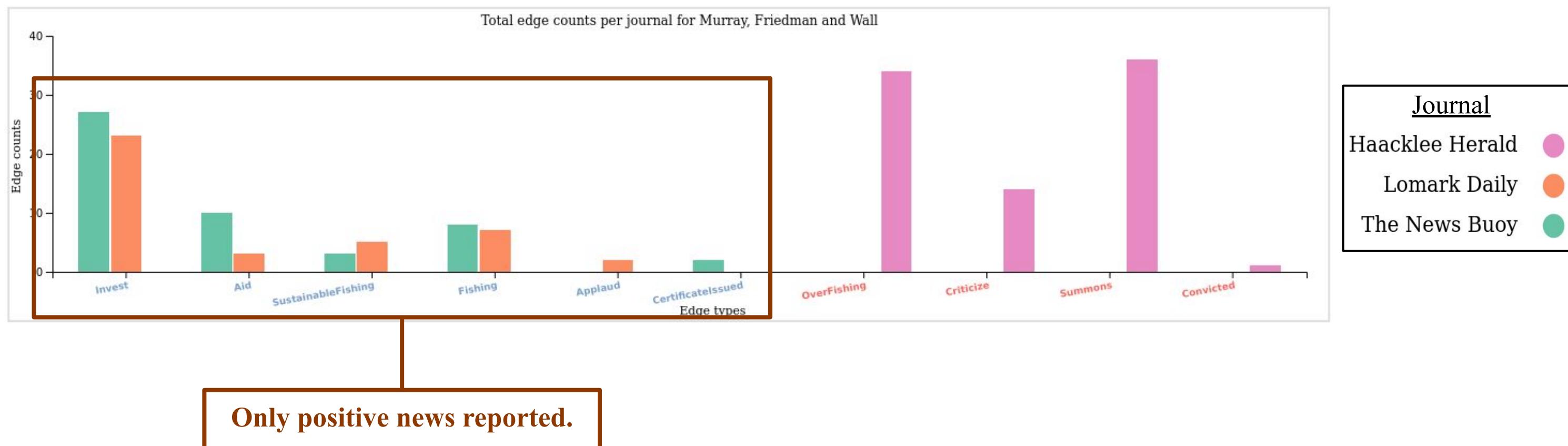
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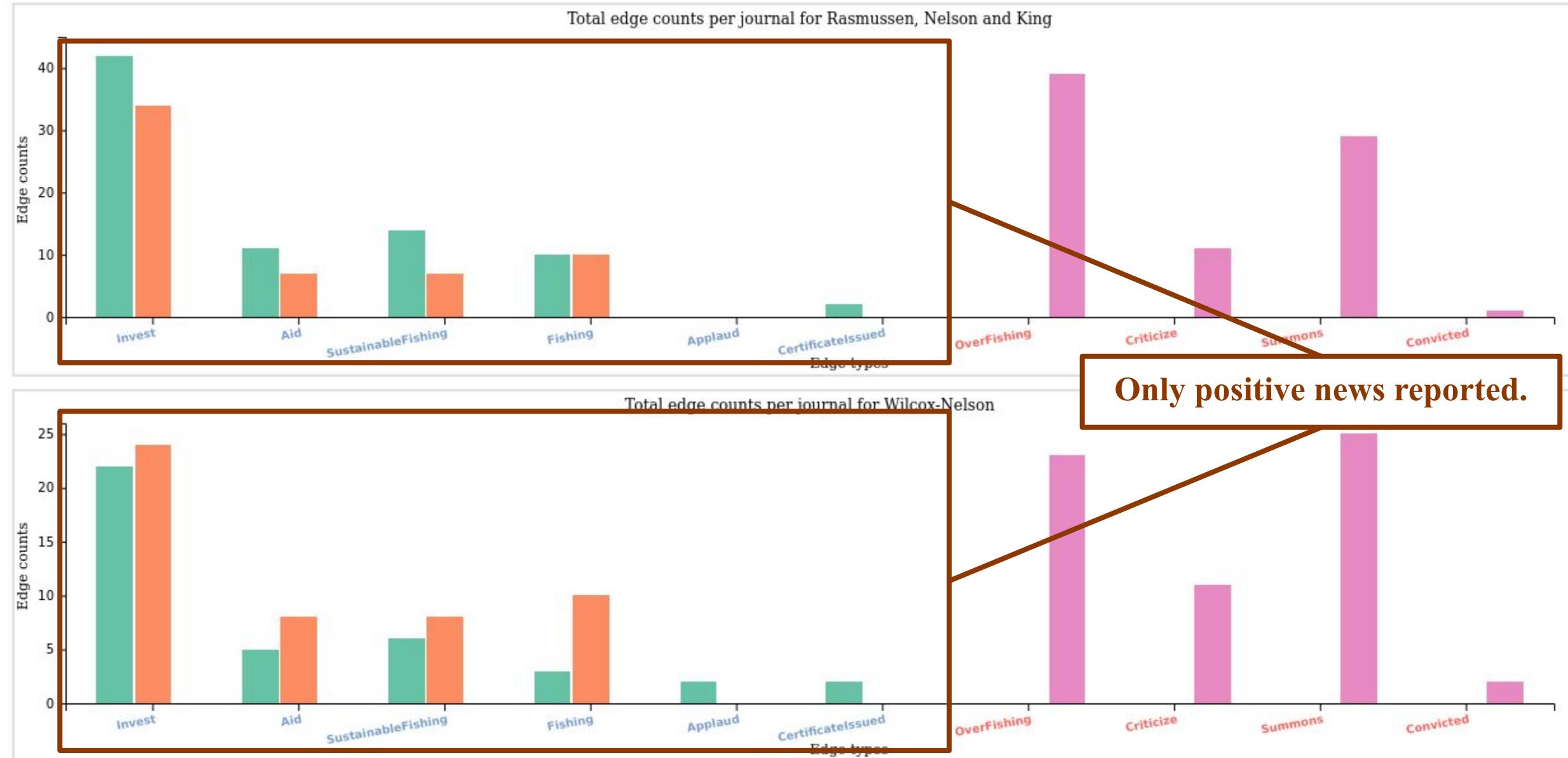
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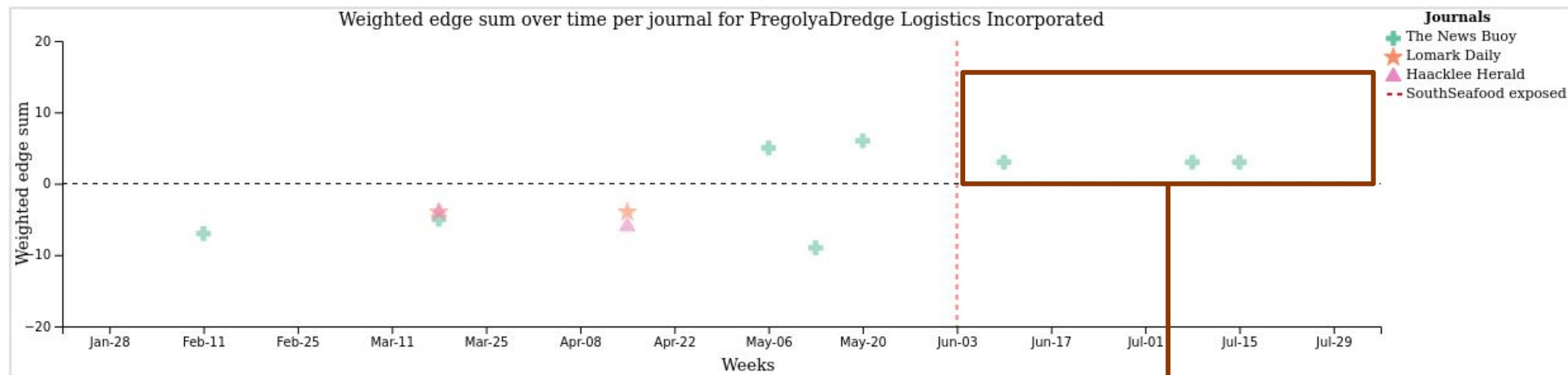
Lomark Daily and The News Buoy may be biased

Possible indication of bias for Rasmussen, Nelson and King and Wilcox-Nelson.



Possible bias favoring Conti family

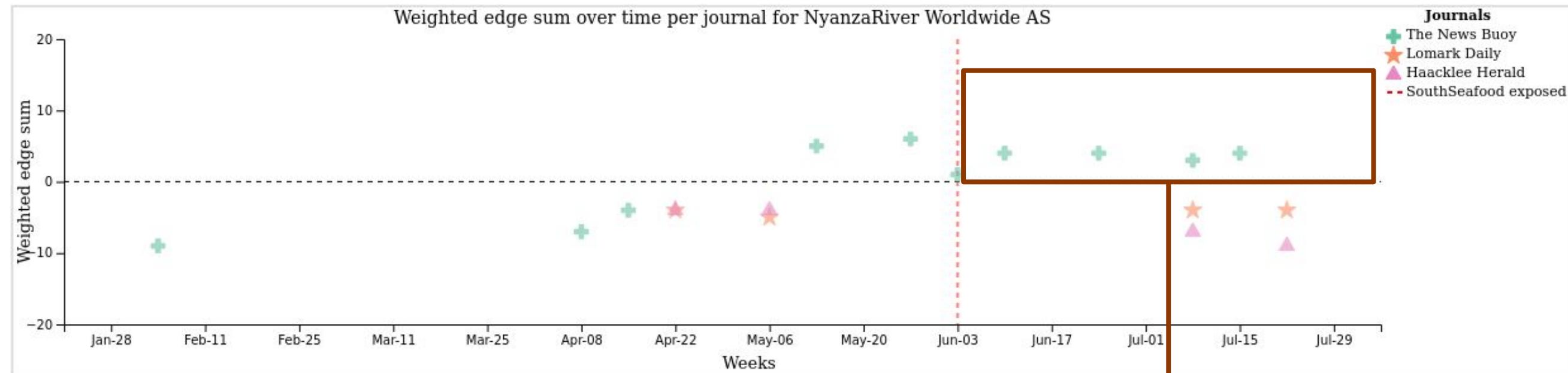
Four companies were favored by **The News Buoy** since the SouthSeafood incident.



Only positive news reported.

Possible bias favoring Conti family

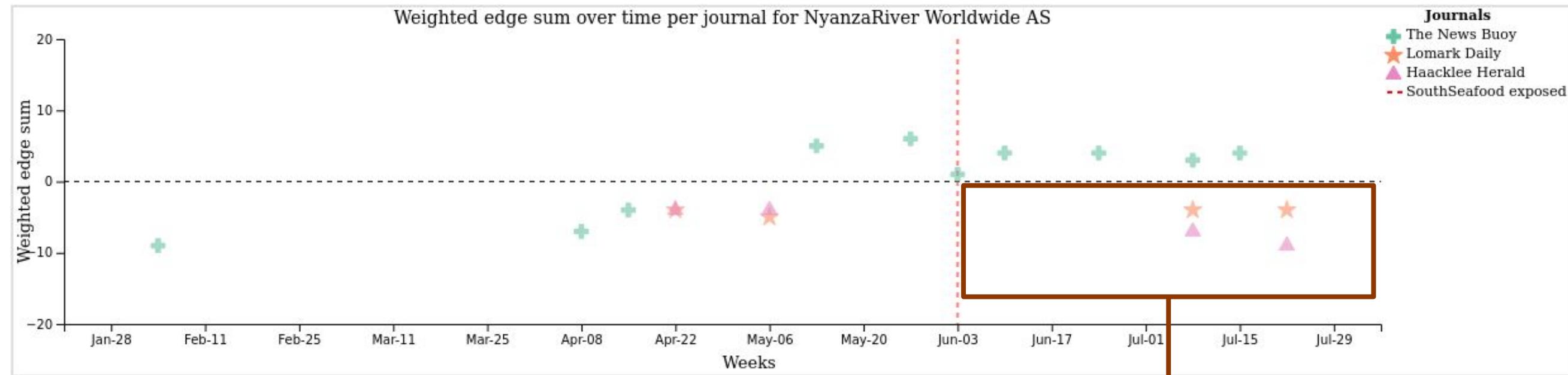
Similar pattern for NyanzaRiver Worldwide AS.



Only positive news reported.

Possible bias favoring Conti family

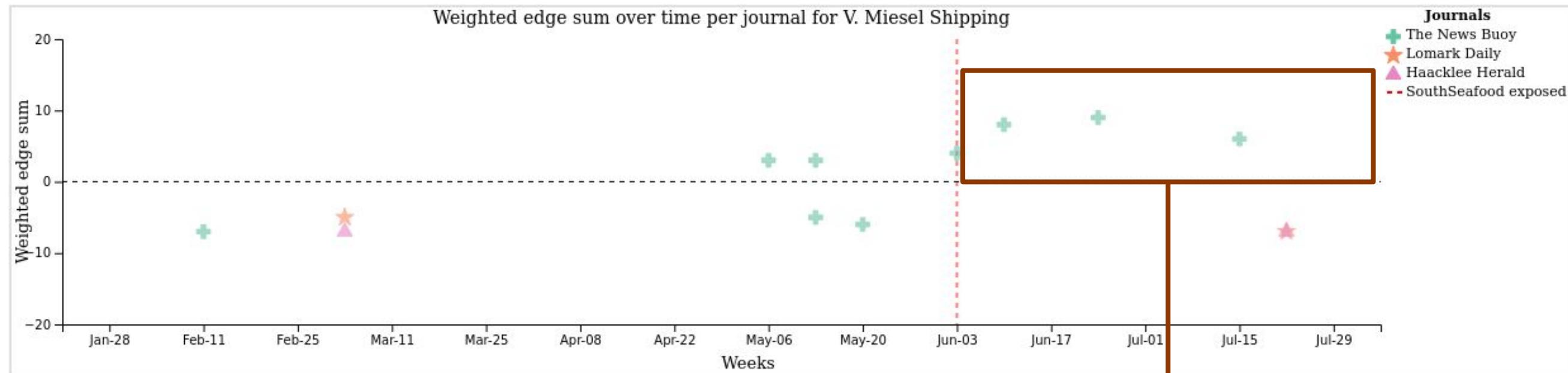
Similar pattern for NyanzaRiver Worldwide AS.



The other two journals
reported negative news.

Possible bias favoring Conti family

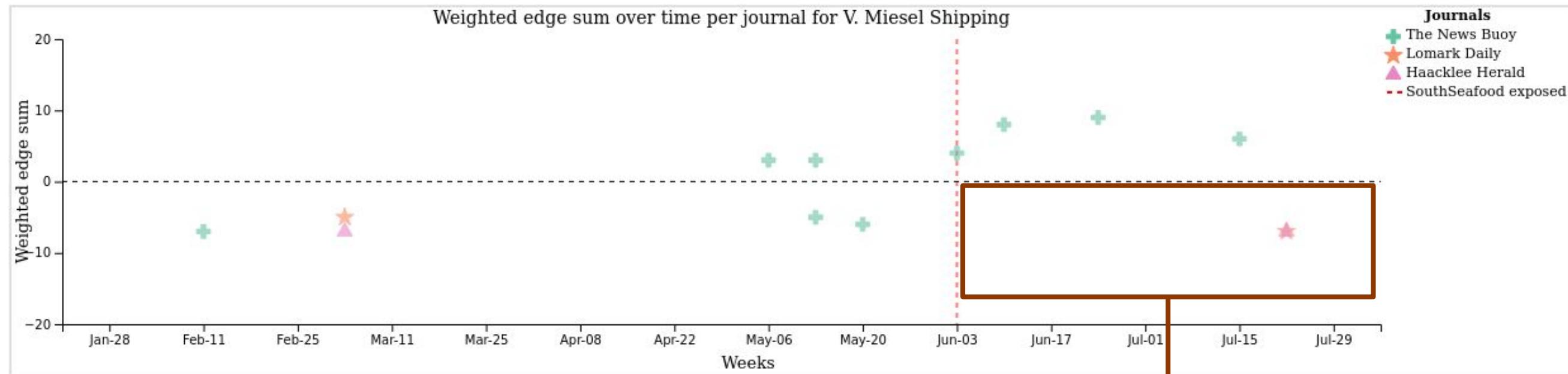
Another example of discordant reporting for V. Miesel Shipping.



Only positive news reported.

Possible bias favoring Conti family

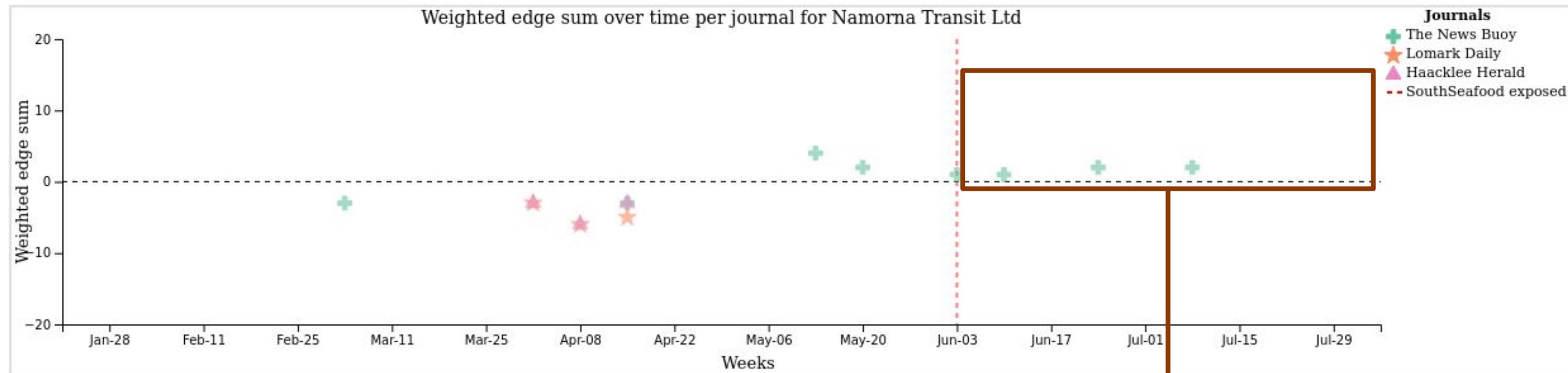
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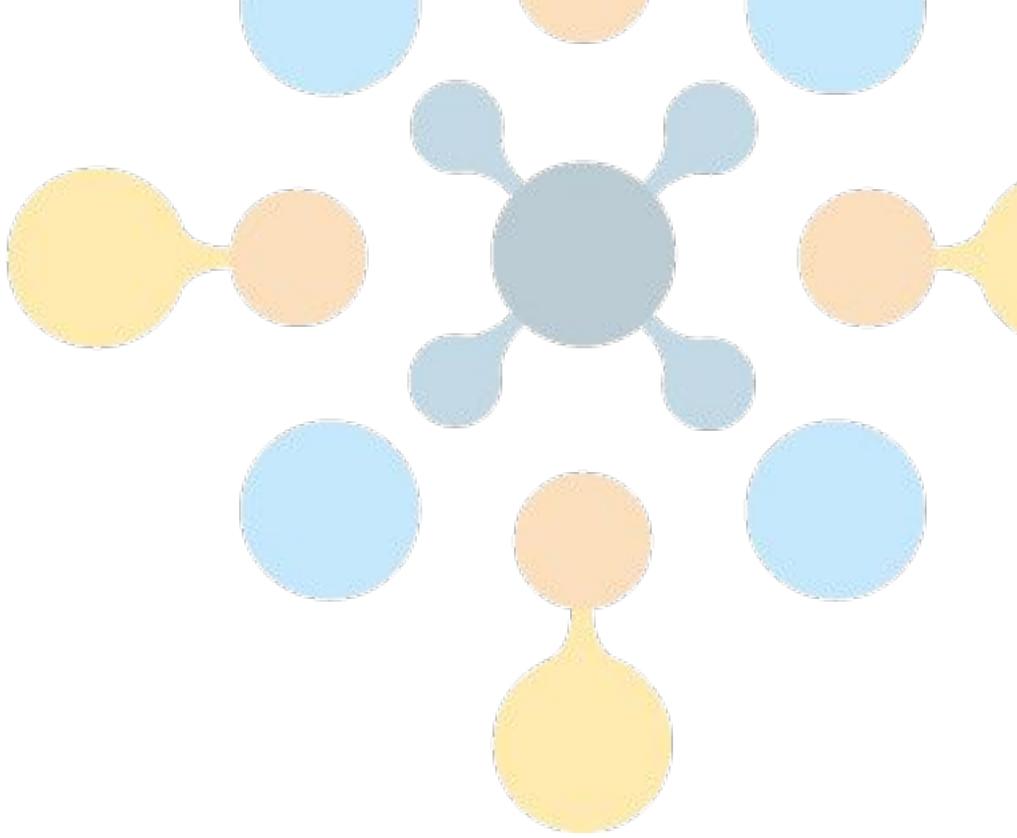
Possible bias favoring Conti family

All of these companies belong to a member of the Conti family.



Only positive news reported.

Analyst Bias



Analyst Bias

- Comparison between analysts.
- Detecting suspicious behavior.
- Examples of Junior Shurdlu and Harvey Janus.

Analysts

14 Analysts

- Clepper Jessen
- Greta Grass-Hill
- Haenyeo Hyun-Ki
- Harvey Janus
- Jack Inch
- Junior Shurdlu
- Kristin Baker
- Melinda Manning
- Niklaus Oberon
- Olokun Daramola
- Pelagia Alethea Mordoch
- Urashima Tarō
- Worf Peer
- **Felipe (Our Analyst)**

Analysts

13 analysts only
add edges to the
graph

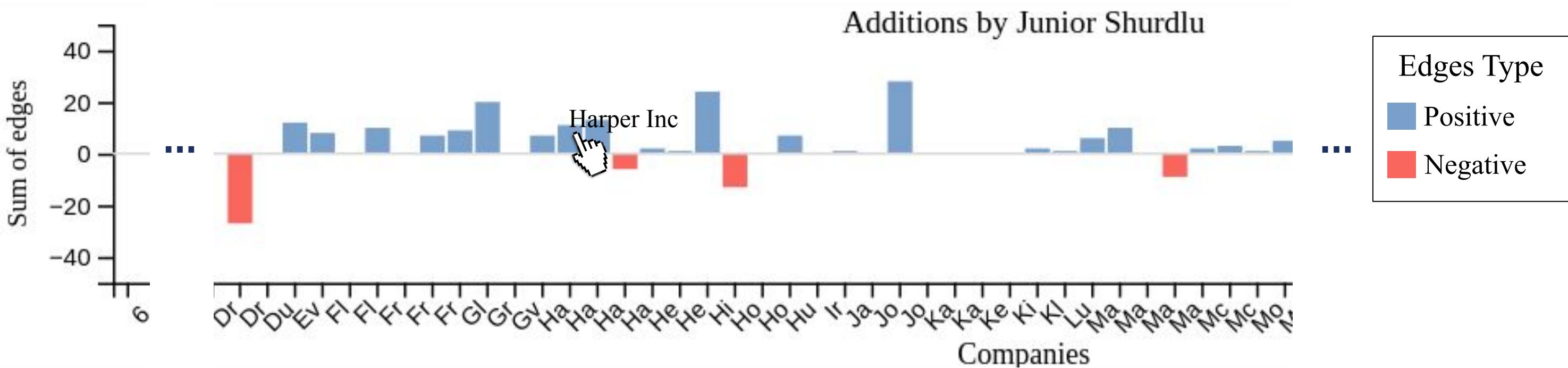
The only edges with
different values for **the
date added and the
date last edited** belong
to Harvey.

- Clepper Jessen
- Greta Grass-Hill
- Haenyeo Hyun-Ki
- **Harvey Janus**
- Jack Inch
- Junior Shurdlu
- Kristin Baker
- Melinda Manning
- Niklaus Oberon
- Olokun Daramola
- Pelagia Alethea Mordoch
- Urashima Tarō
- Worf Peer
- **Felipe (Our Analyst)**

Edit edge data in the
graph.

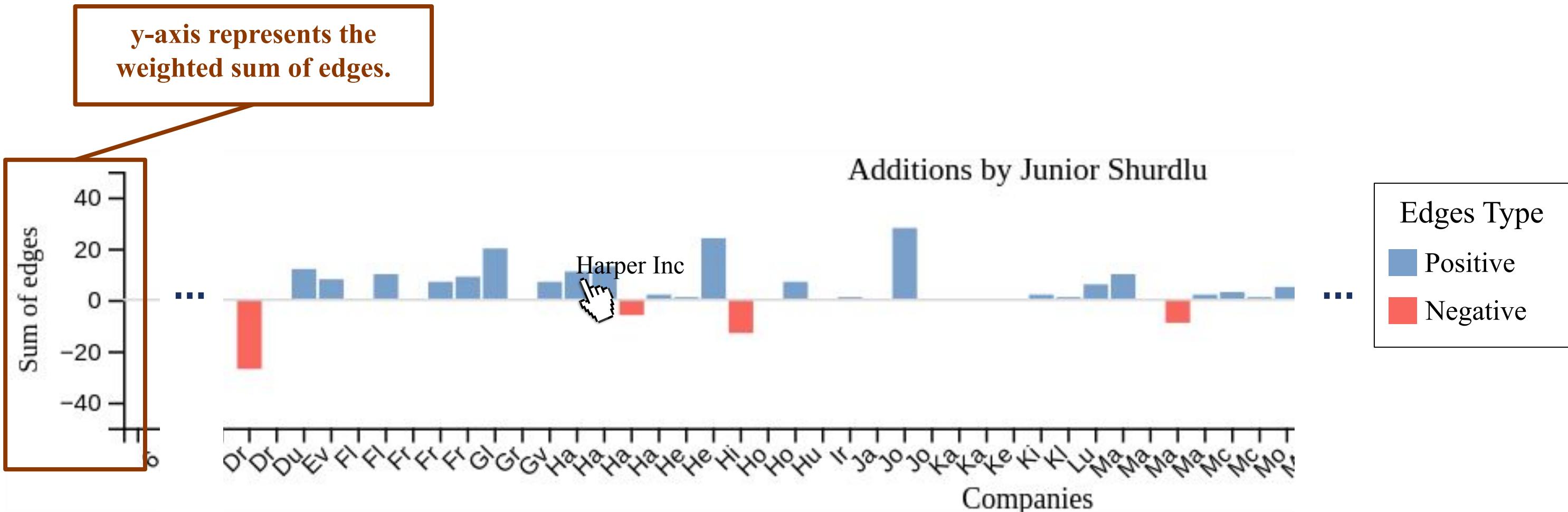
Analyst bias

Summary of Analysts activity regarding companies.



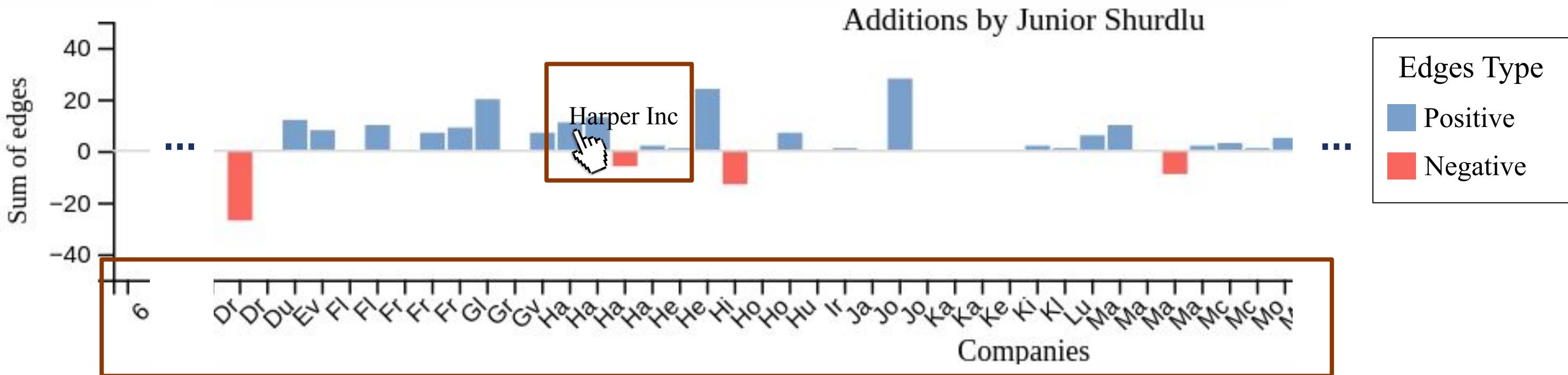
Analyst bias

Summary of Analysts activity regarding companies.



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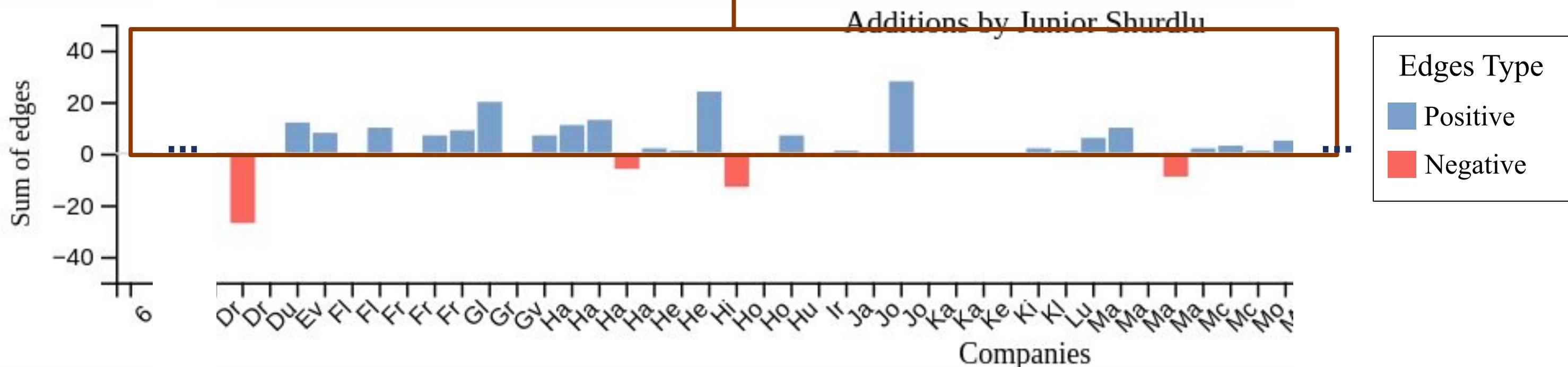


x-axis represents the companies.

Analyst bias

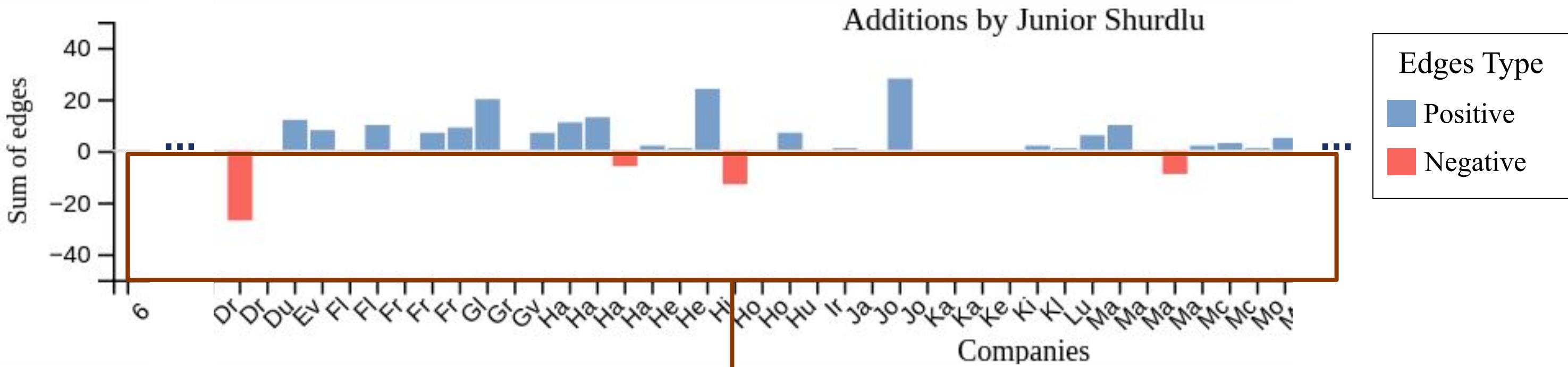
Summary of Analysts activity regarding companies.

Positive sums edges above the x-axis.



Analyst bias

Summary of Analysts activity regarding companies

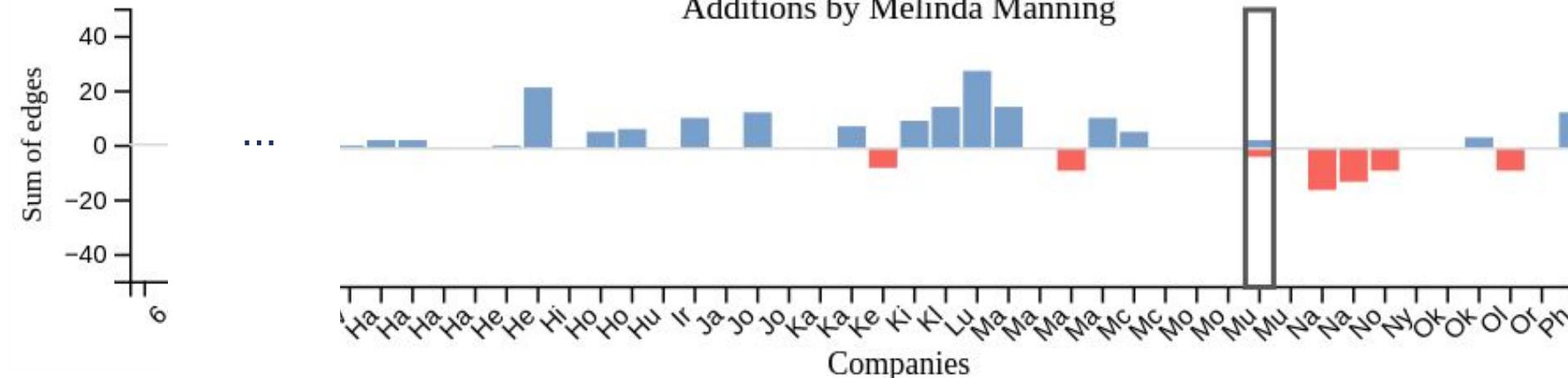
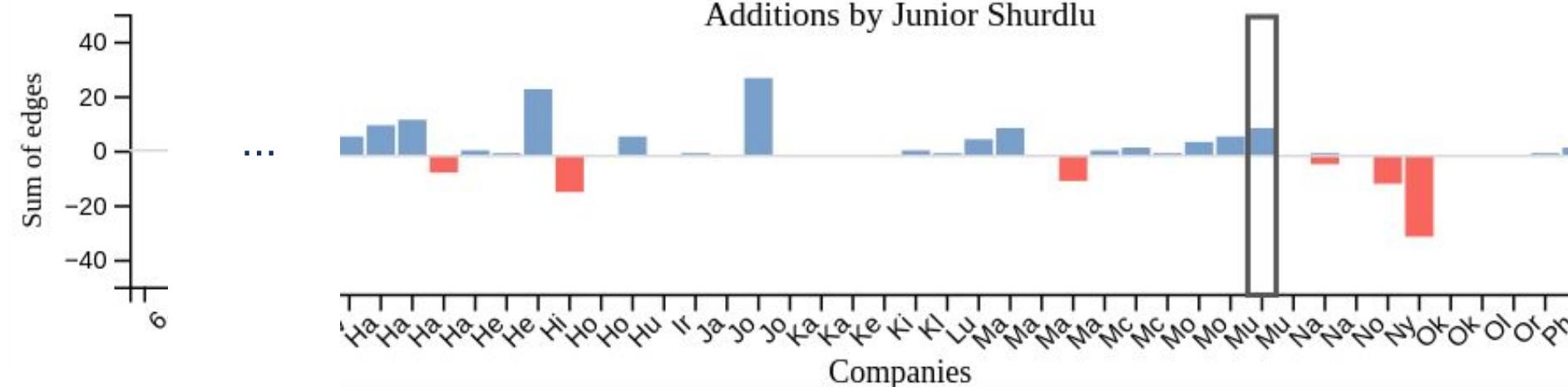
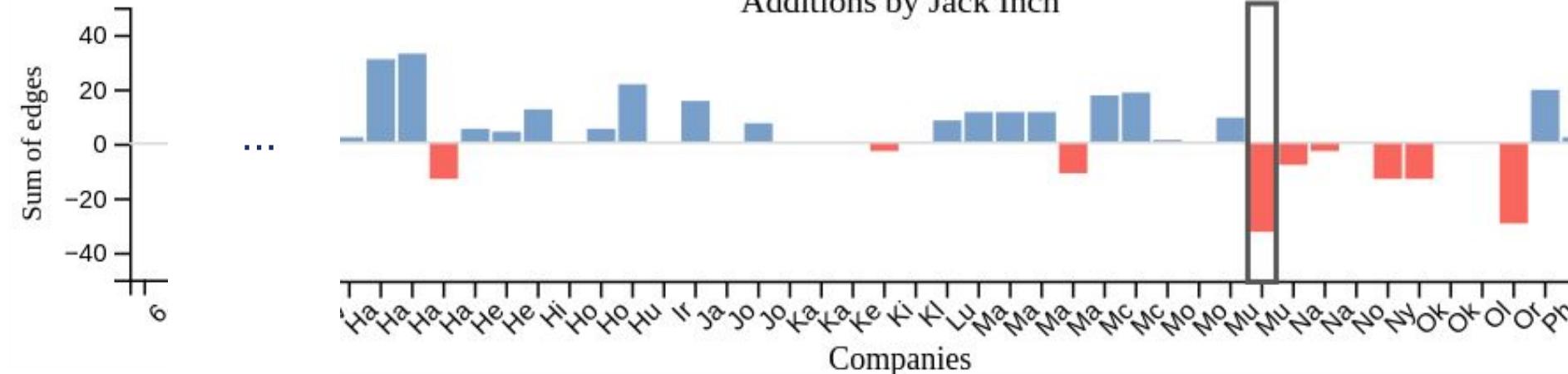


Negative sums edges below the x-axis.

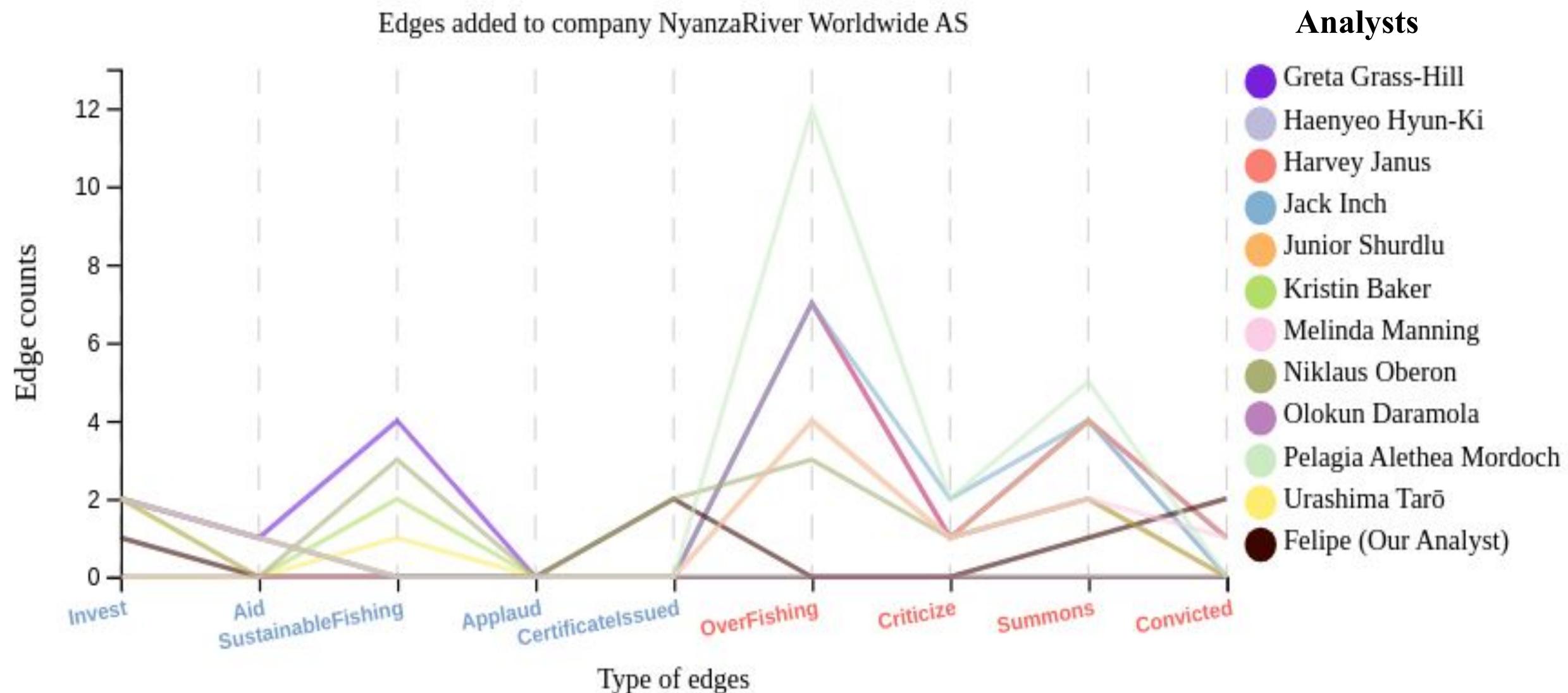
Analyst bias

Selection of companies in each analyst

e.g., Murray, Friedman and Wall

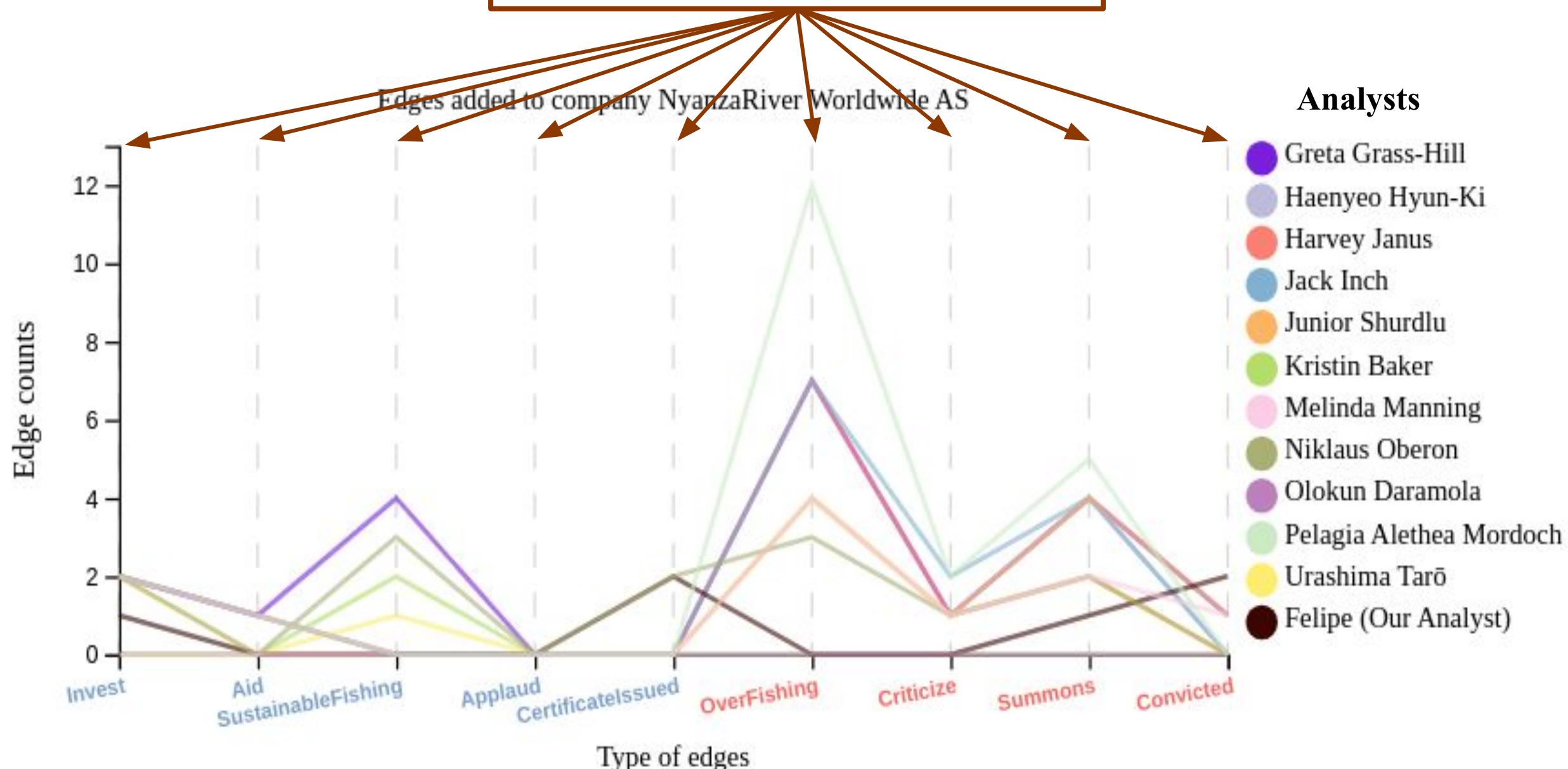


Analyst bias

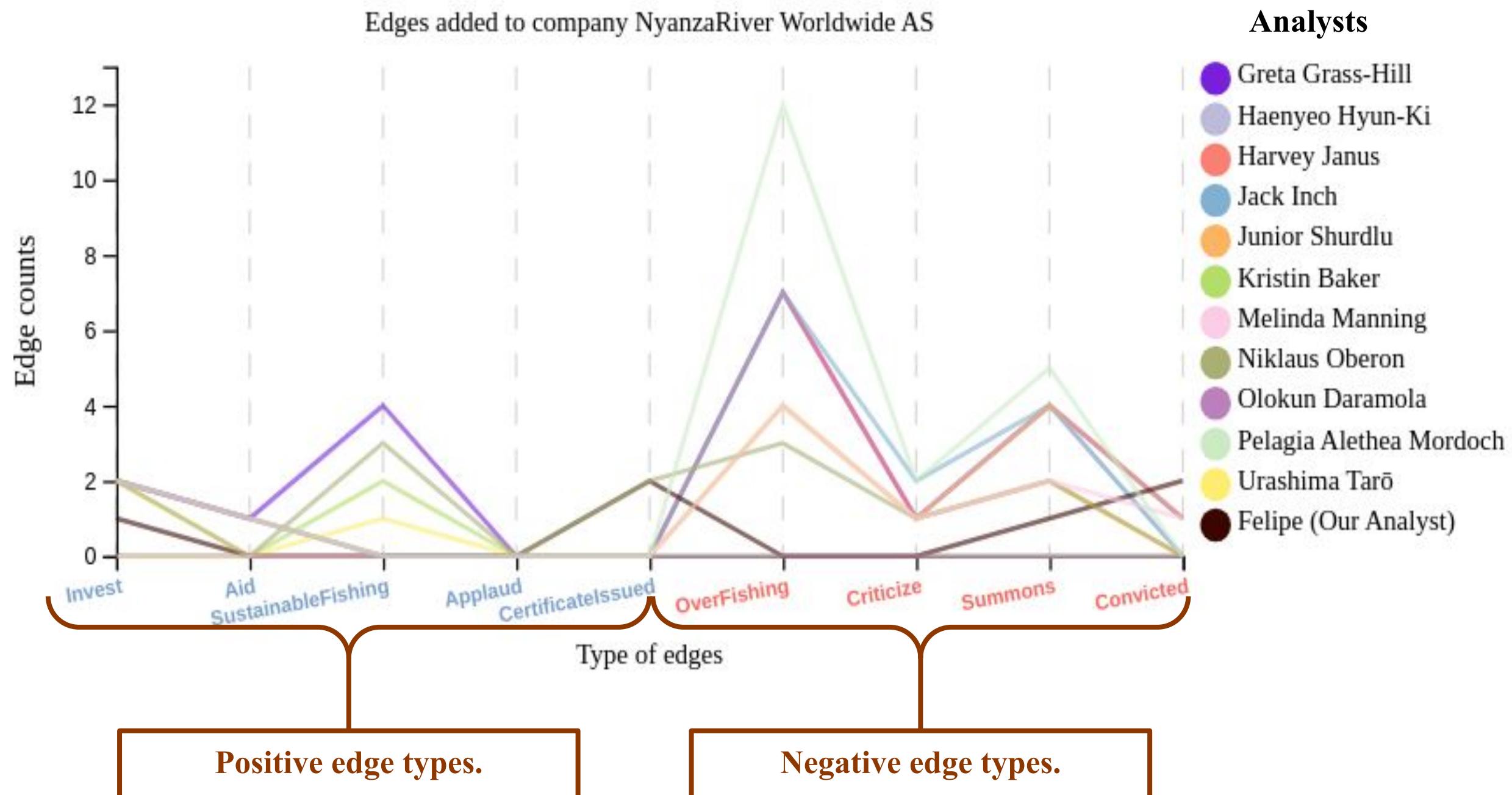


Analyst bias

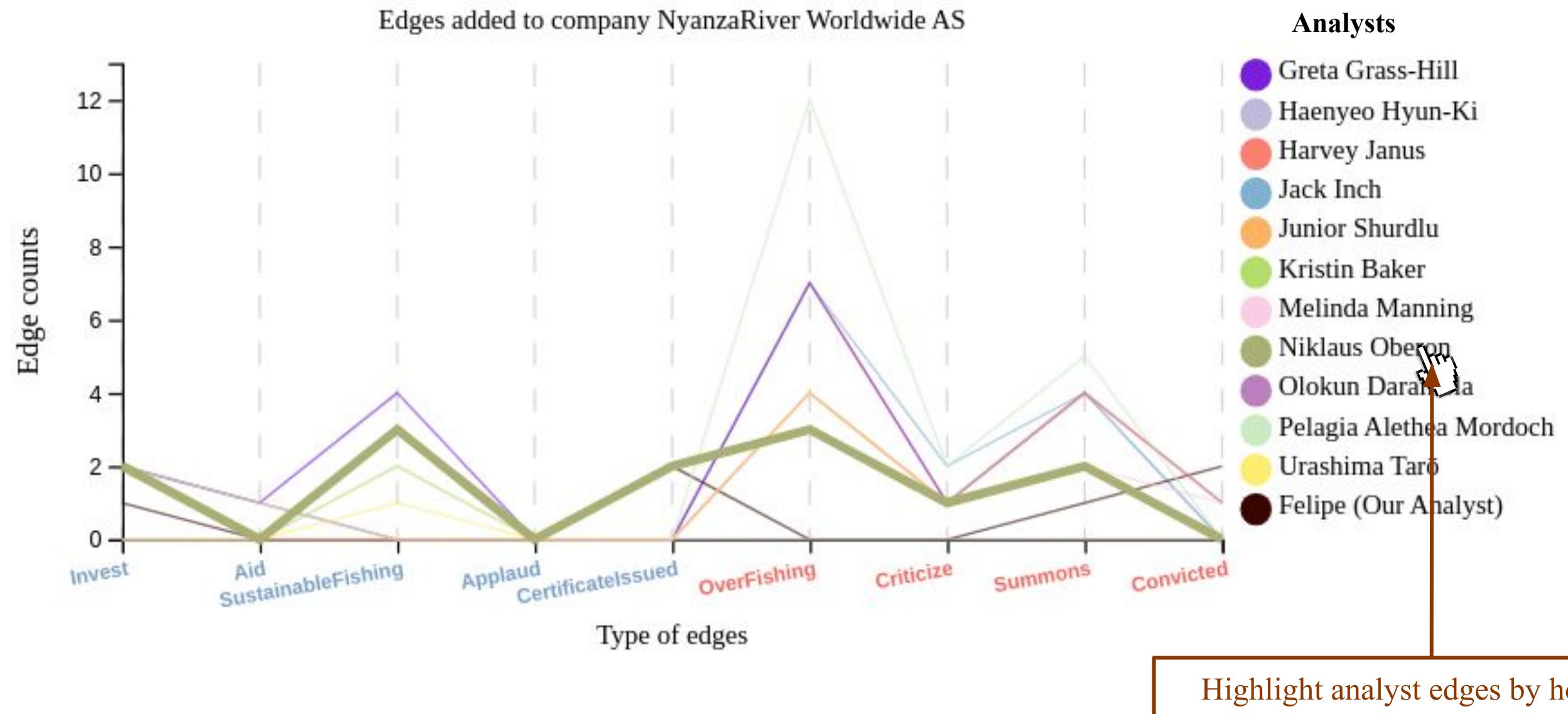
Coordinates represent the number of edges for each type.



Analyst bias

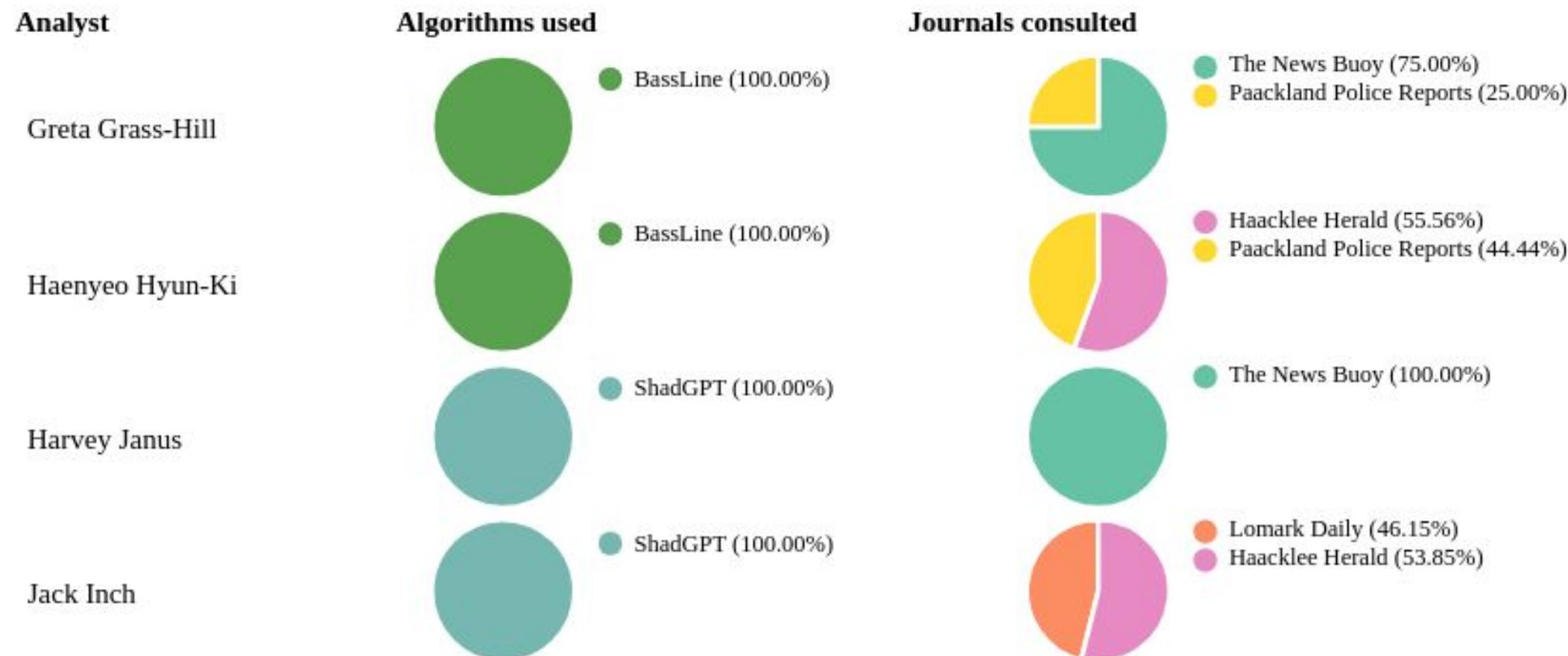


Analyst bias



Analyst bias

Proportion of edges per algorithm and journal.



Analyst bias

Proportion of edges per algorithm and journal.

Analyst

Greta Grass-Hill

Haenyeo Hyun-Ki

Harvey Janus

Jack Inch

Algorithms used

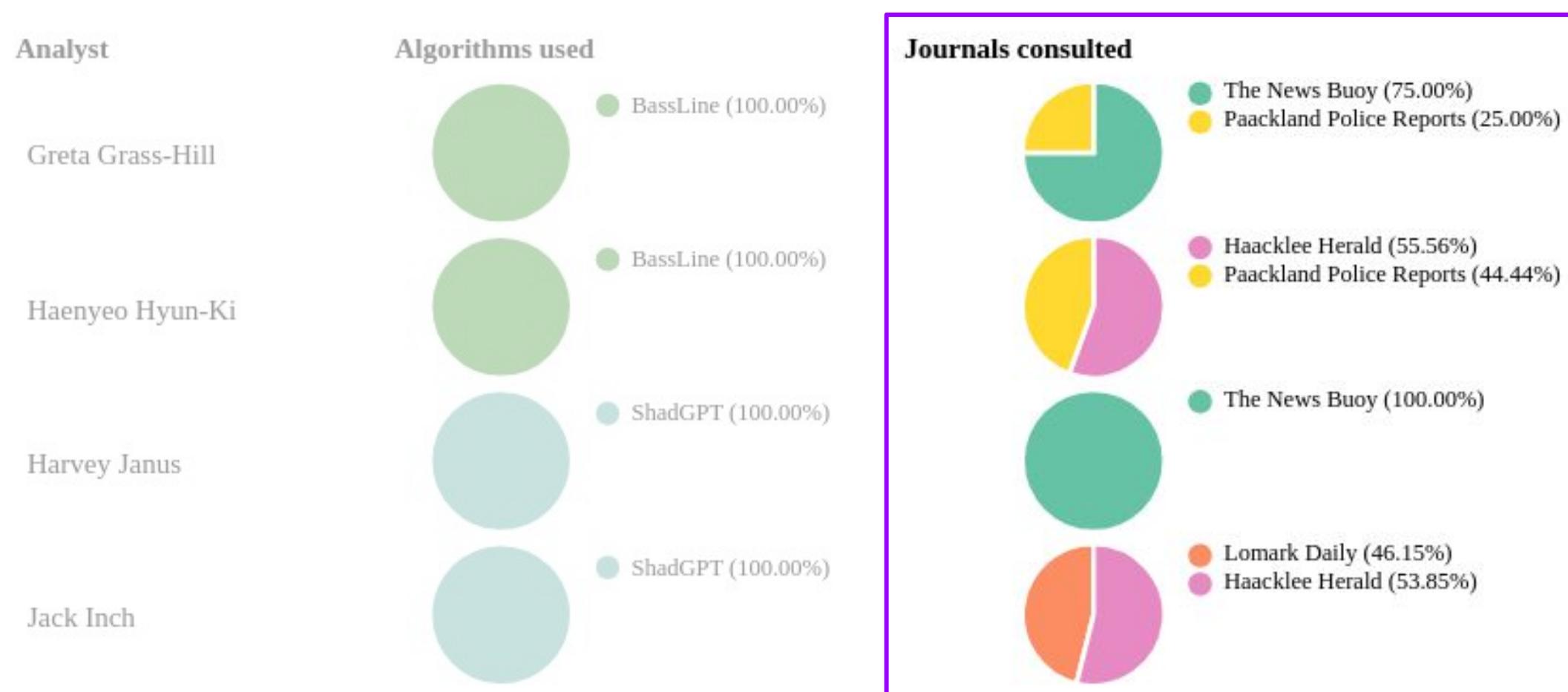


Journals consulted



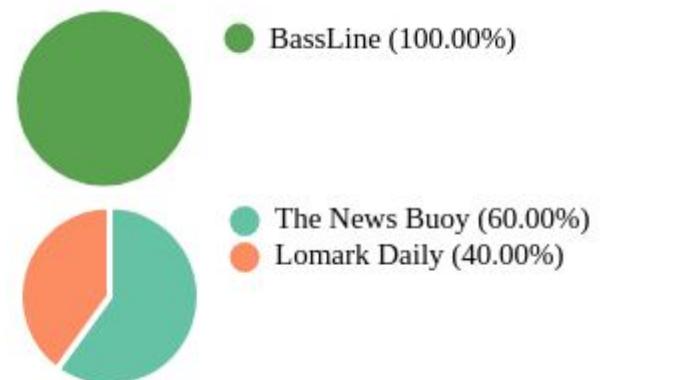
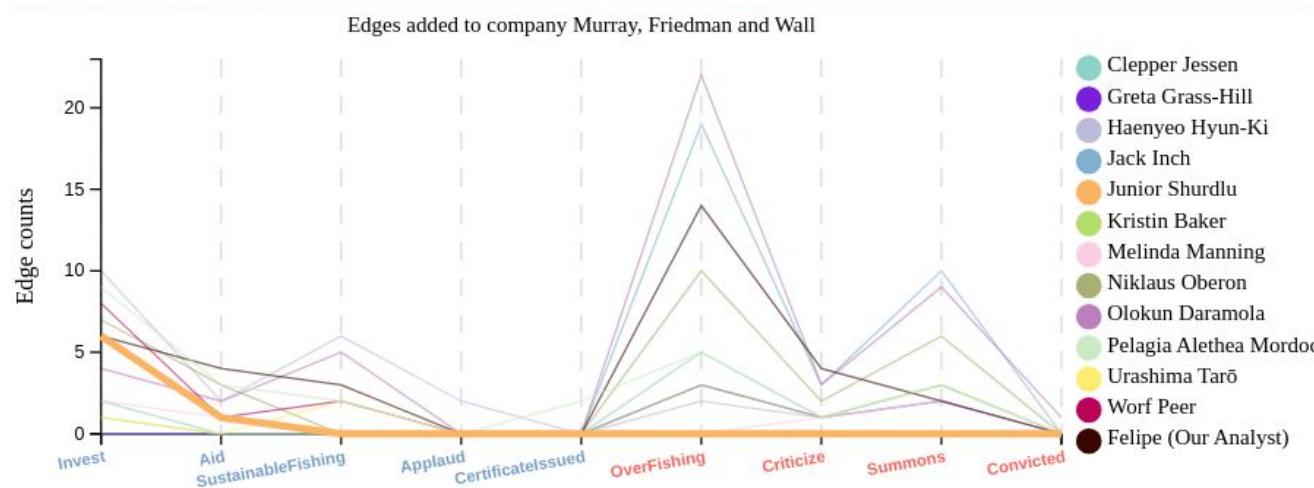
Analyst bias

Proportion of edges per algorithm and journal.

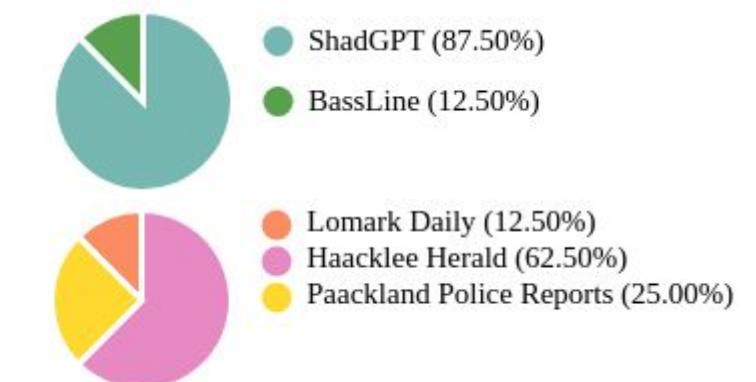
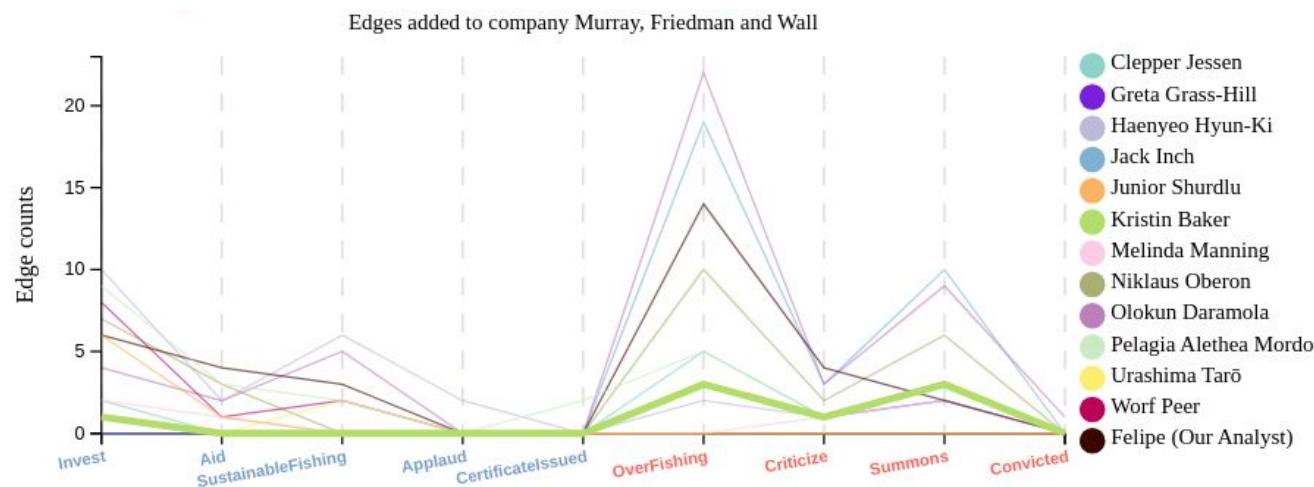


The case of Junior Shurdlu

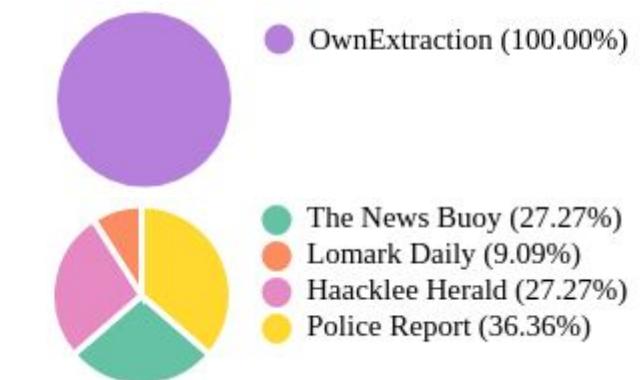
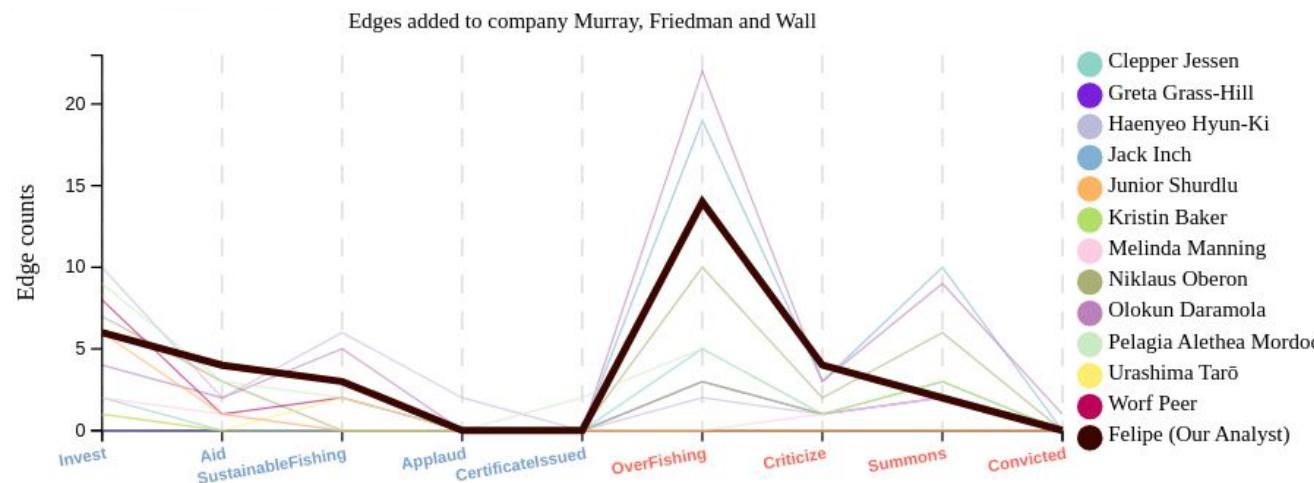
Junior Shurdlu



Kristin Baker

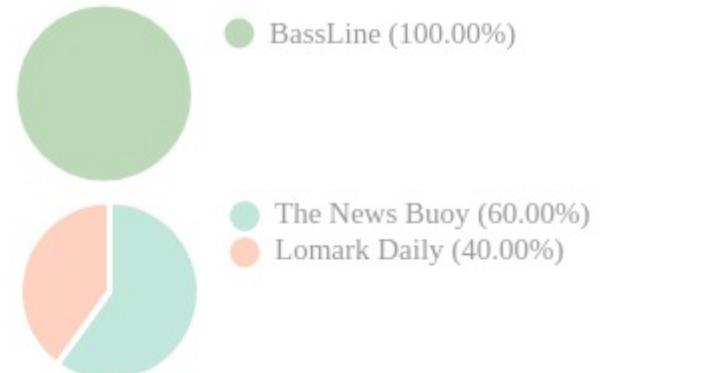


Our analyst

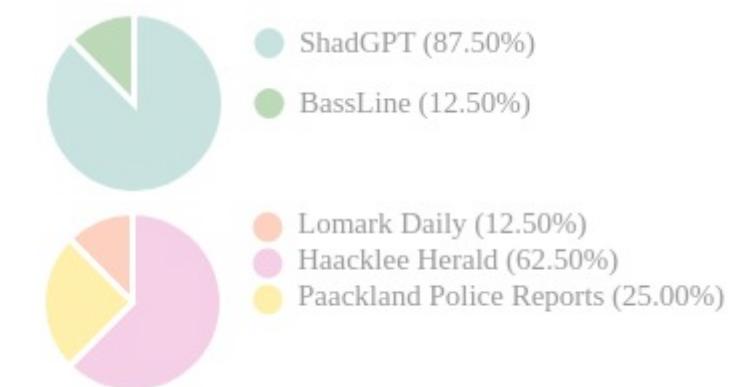
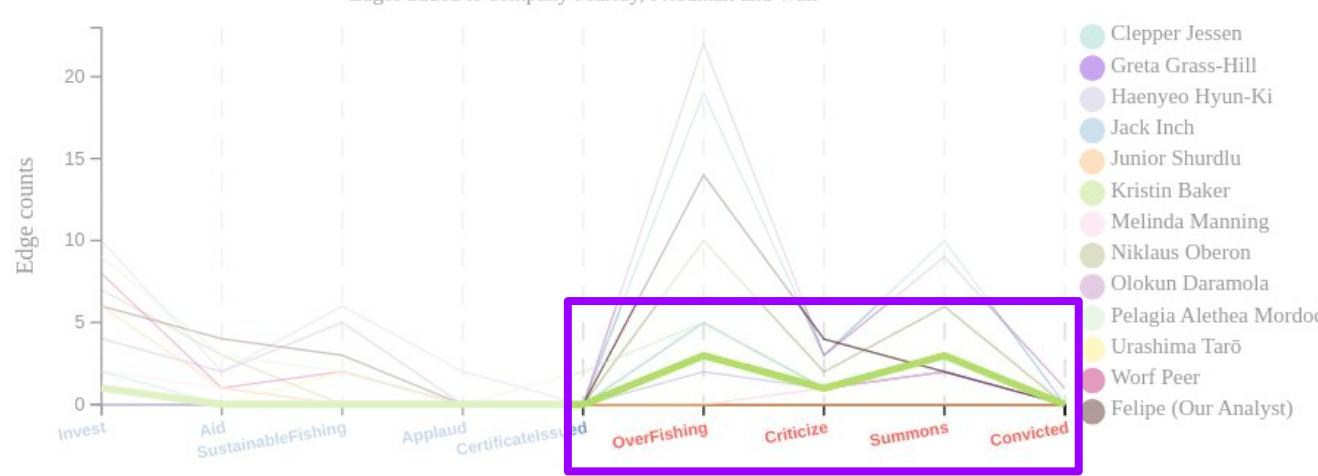


The case of Junior Shurdlu

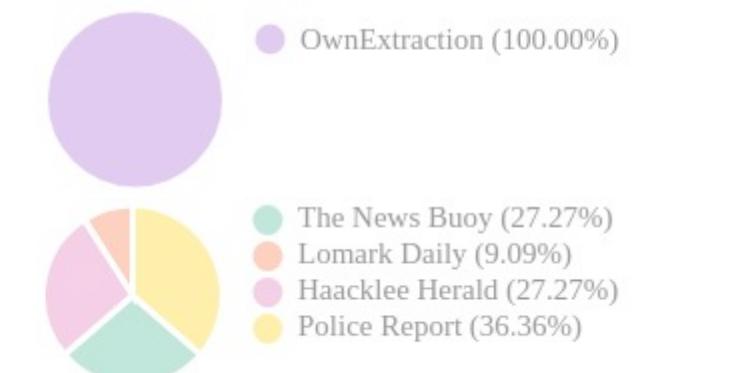
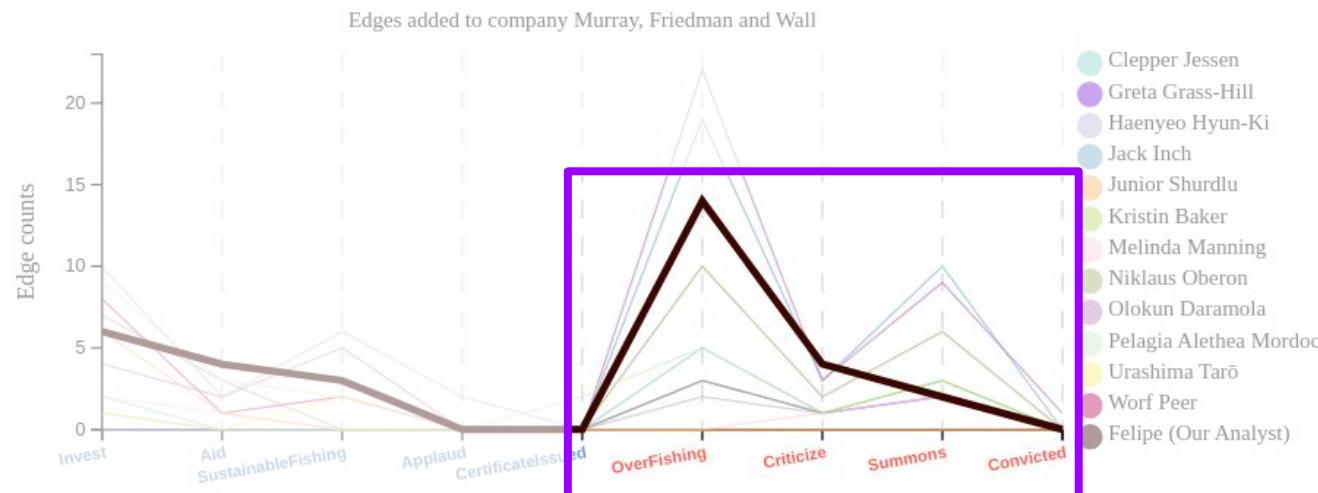
Junior Shurdlu



Kristin Baker

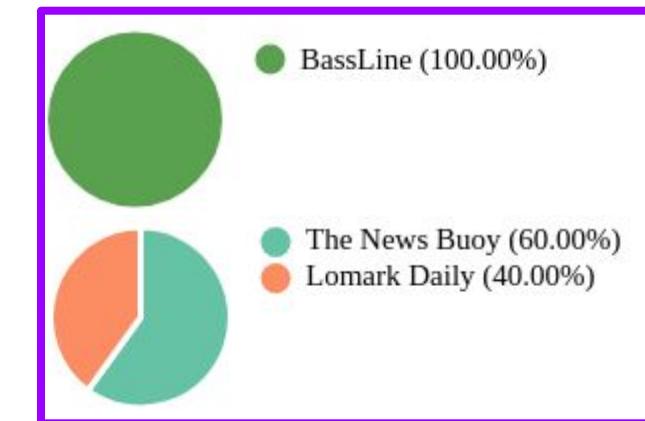
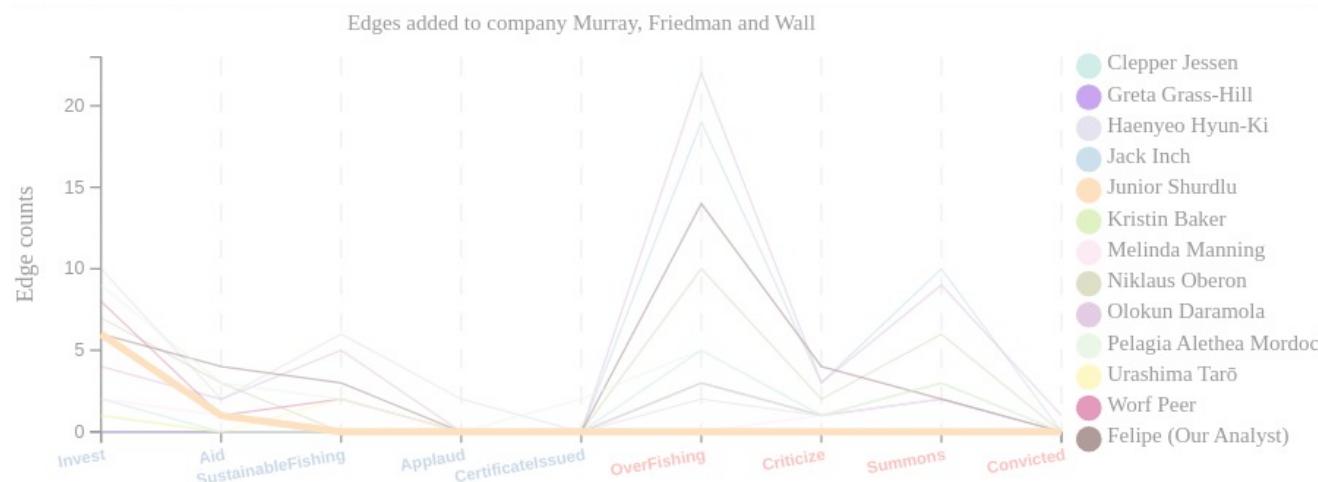


Our analyst

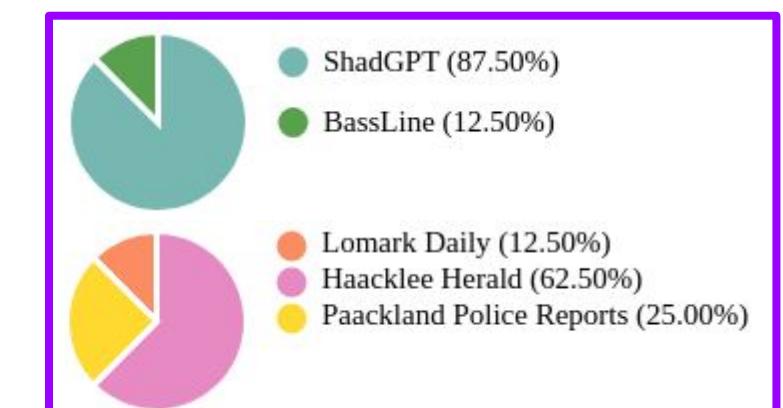
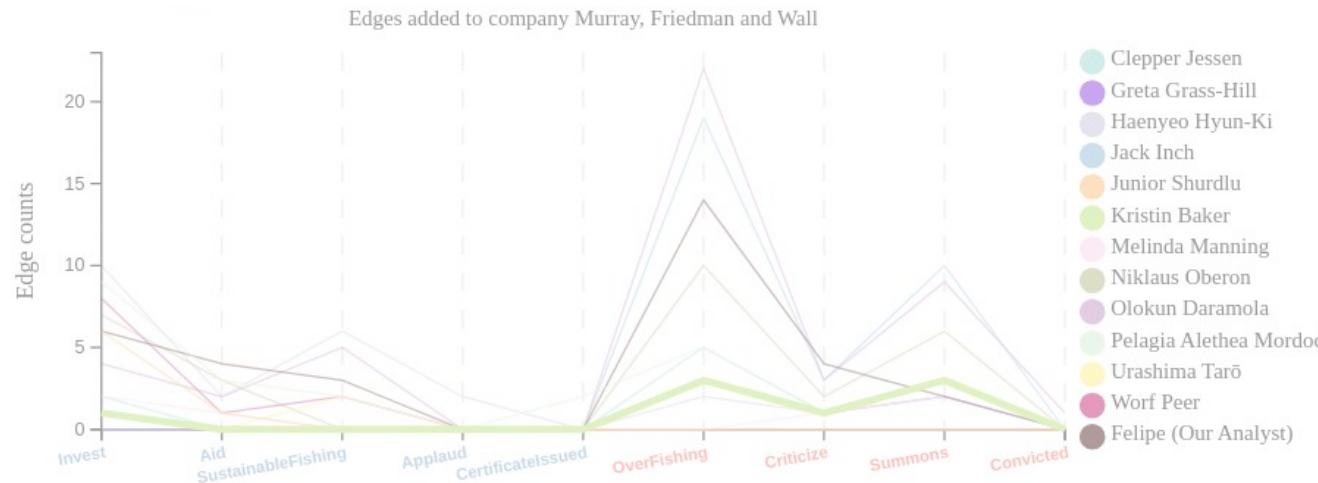


The case of Junior Shurdlu

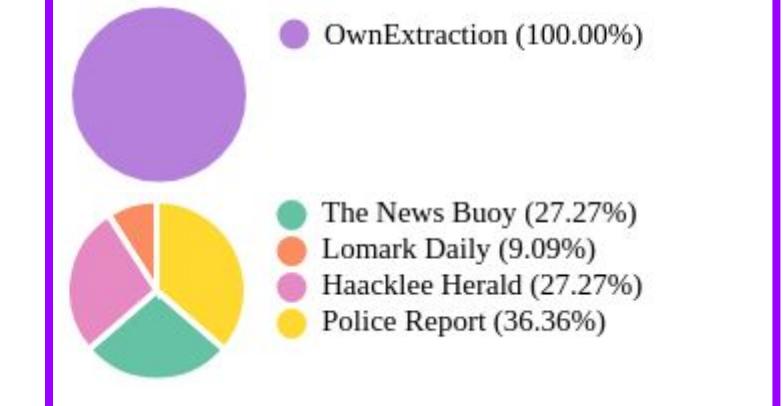
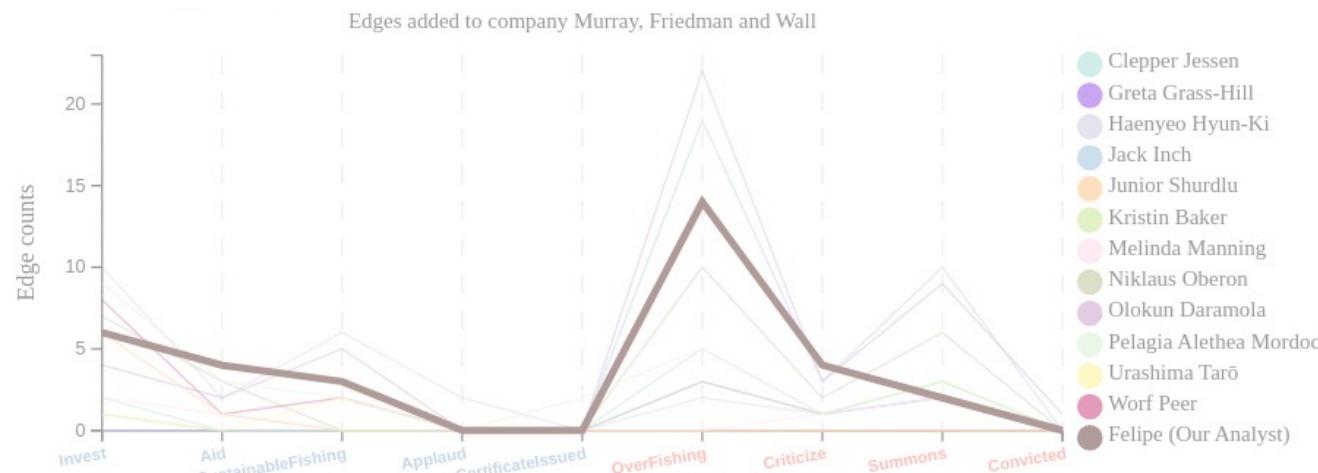
Junior Shurdlu



Kristin Baker



Our analyst



Analysts

We found up to 4 analysts with suspicious behavior for certain companies

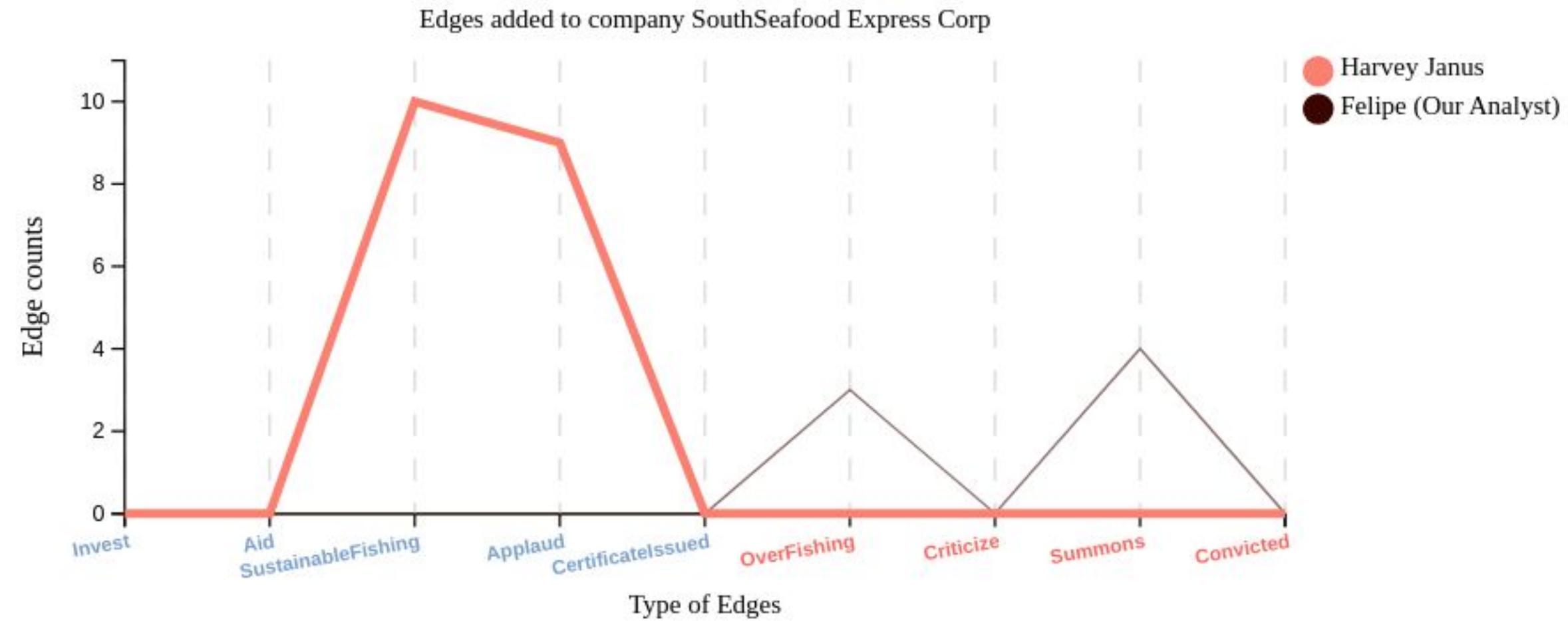
- Clepper Jessen
- Greta GRass-Hill
- Haenyeo Hyun-Ki
- Jack Inch
- Melinda Manning
- Olokun Daramola
- Pelagia Alethea Mordoch
- Urashima Tarō
- Worf Peer
- **Felipe (Our Analyst)**
- Niklaus Oberon
- Junior Shurdlu
- Kristin Baker
- Harvey Janus

Analysts

Harvey Janus is the
only one who added
edges to the company
SouthSeafood Express
Corp

- Clepper Jessen
- Greta GRass-Hill
- Haenyeo Hyun-Ki
- Jack Inch
- Melinda Manning
- Olokun Daramola
- Pelagia Alethea Mordoch
- Urashima Tarō
- Worf Peer
- *Felipe (Our Analyst)
- Niklaus Oberon
- Junior Shurdlu
- Kristin Baker
- **Harvey Janus**

The case of Harvey Janus



Analyst

Harvey Janus

Algorithms used

BassLine (100.00%)

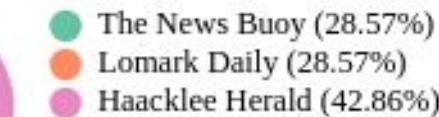
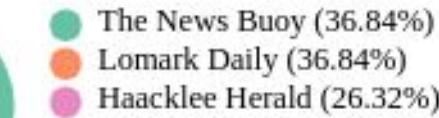


OwnExtraction (100.00%)



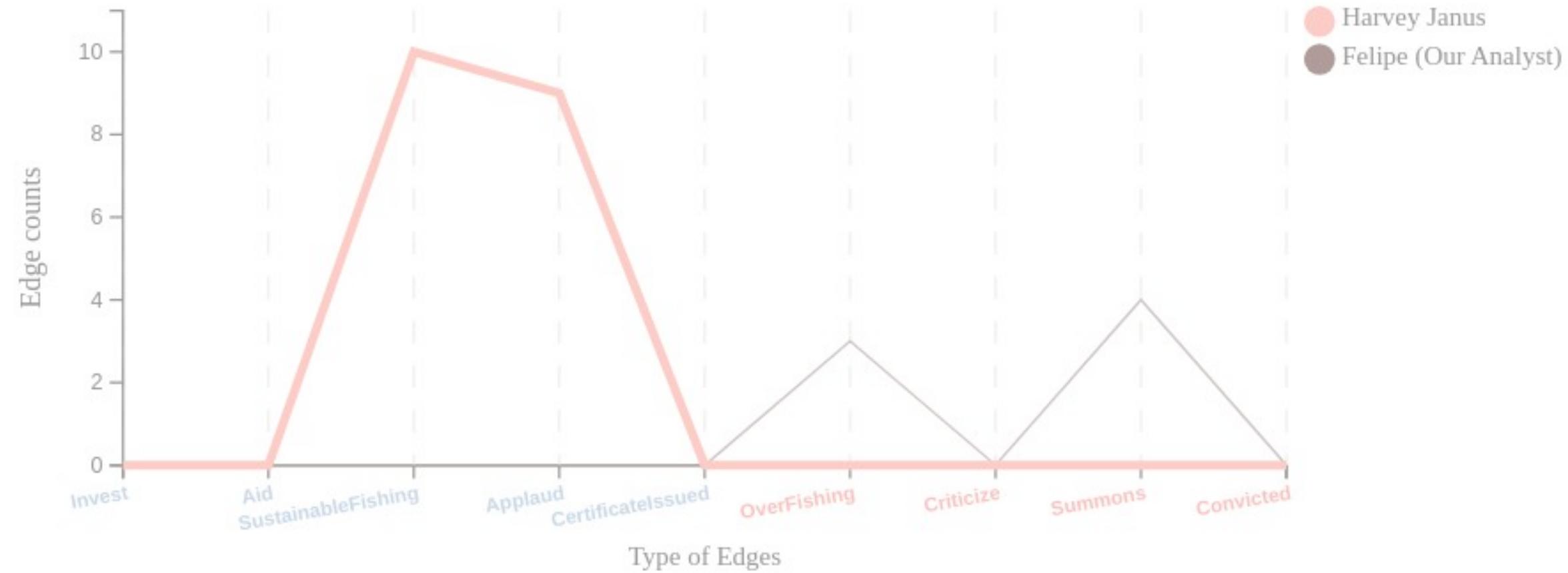
Felipe (Our Analyst)

Journals consulted



The case of Harvey Janus

Edges added to company SouthSeafood Express Corp



Analyst

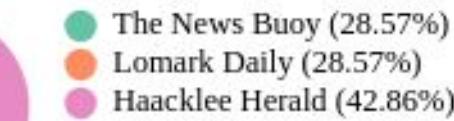
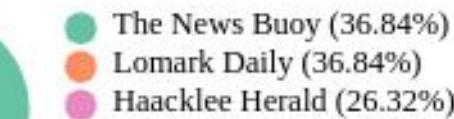
Harvey Janus

Felipe (Our Analyst)

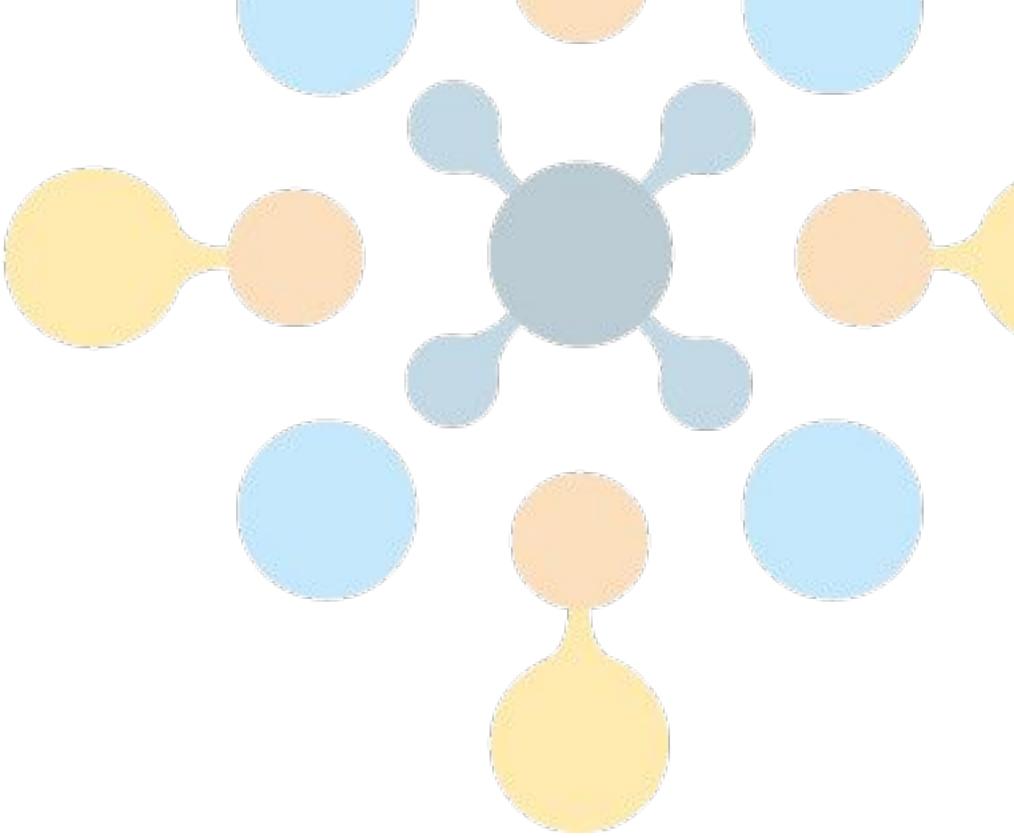
Algorithms used



Journals consulted



Algorithm Bias



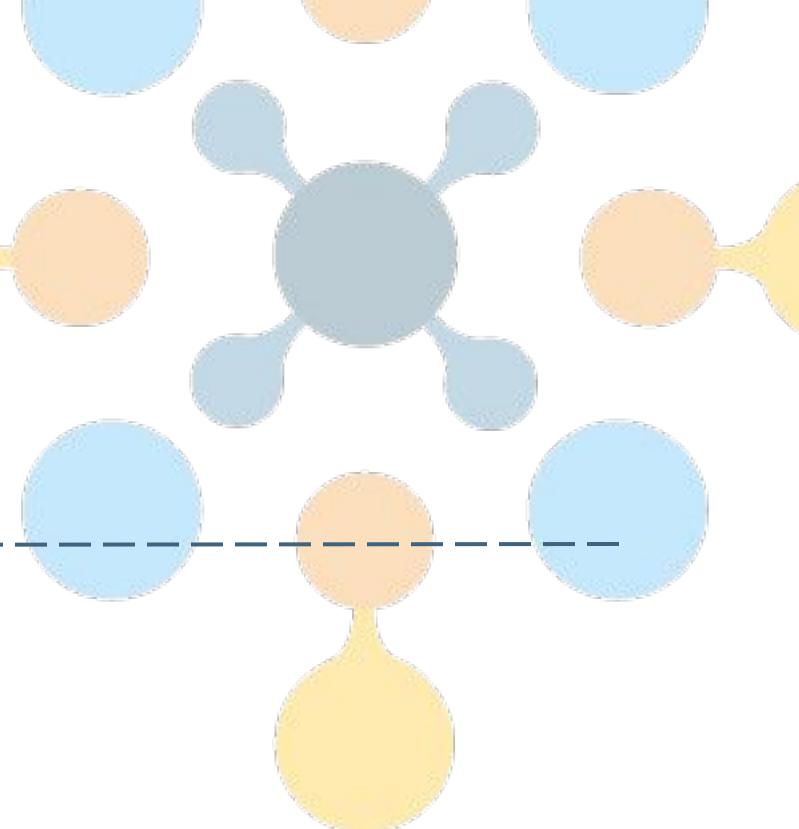
Algorithm Bias

- From our analysis we cannot conclude a bias in the algorithms.
- Edge extractions have a similar distribution for all algorithms.

THANK YOU



VIS2024



FishBiasLens

Integrating LLMs and Visual Analytics for Bias Detection

Dany Diaz, Felipe Moreno-Vera, Juanpablo Heredia, Fabrício Venturim, Jorge Poco



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