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Can we use workers feedback crowdsourcing to protect apparel factories from reputational damage?

Scoopnest (2017)

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OUTLINE

- Introduction
- Review of Literature
- Methodology
- Data Analysis
- Findings, Implications, and Future Research

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- **Why Apparel Industry?**

✓ Outsourcing
✓ Abusive working condition

- **Why Labor abuses ?**

✓ Protest/strikes
✓ Reputational Damage

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FACTORY AUDITS

- To verify the adoption of codes of conduct
- To detect subsequent improvements

Egels, & Lindholm (2015)

Locke, Amengual, & Mangla (2009)

Ali Enterprise Factory Collapse

- September 2012
- 3 weeks after SA8000 certification
- 289 workers died

Rana Plaza Collapse

- April 2013
- Certified by BV
- 1000+ workers died

Hansae Vietnam Worker Strikes

- July 2015
- 26 factory audits
- Still poor working conditions

Brown (2017)

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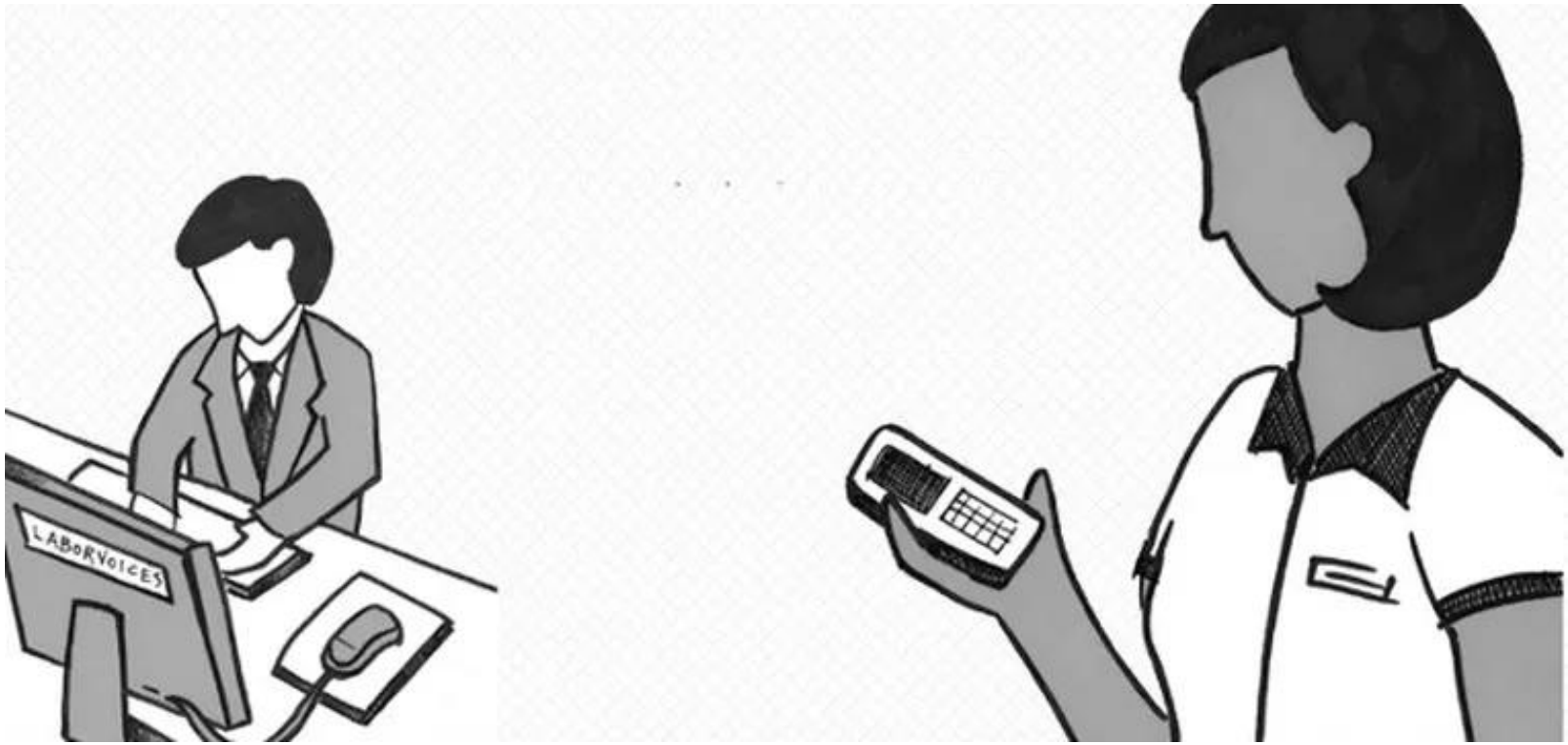
WORKER CROWDSOURCING



Newlands (2017); Bouchery (2016); Martin (2015); Lahiri (2012) , Labor Voices (2016)

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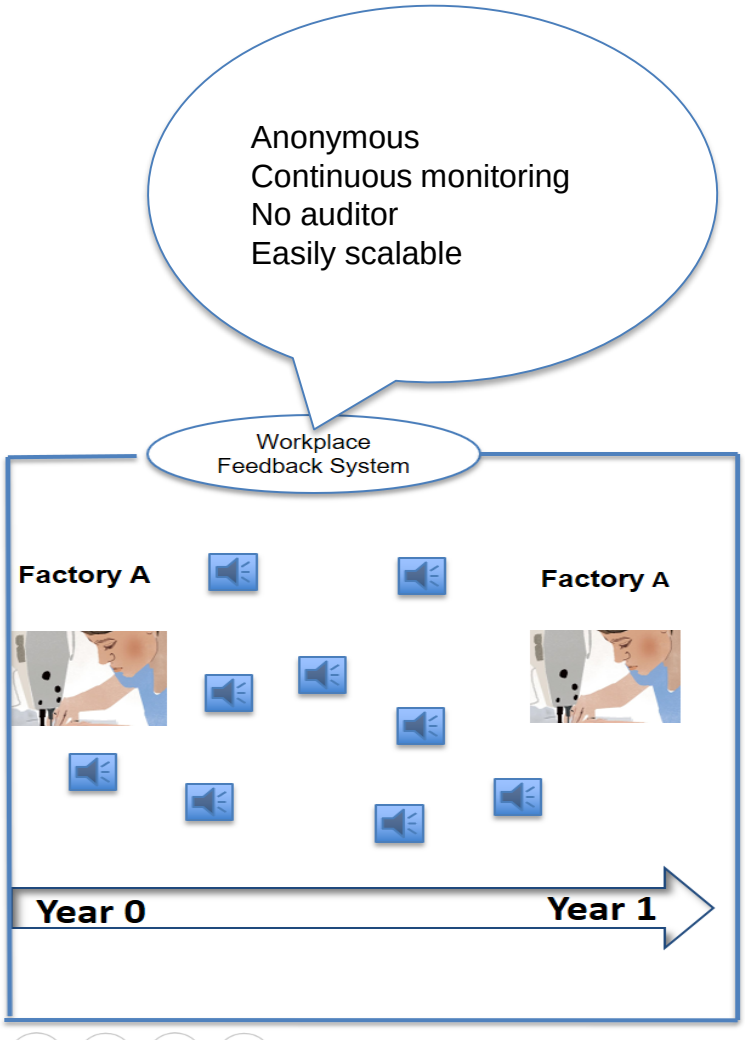
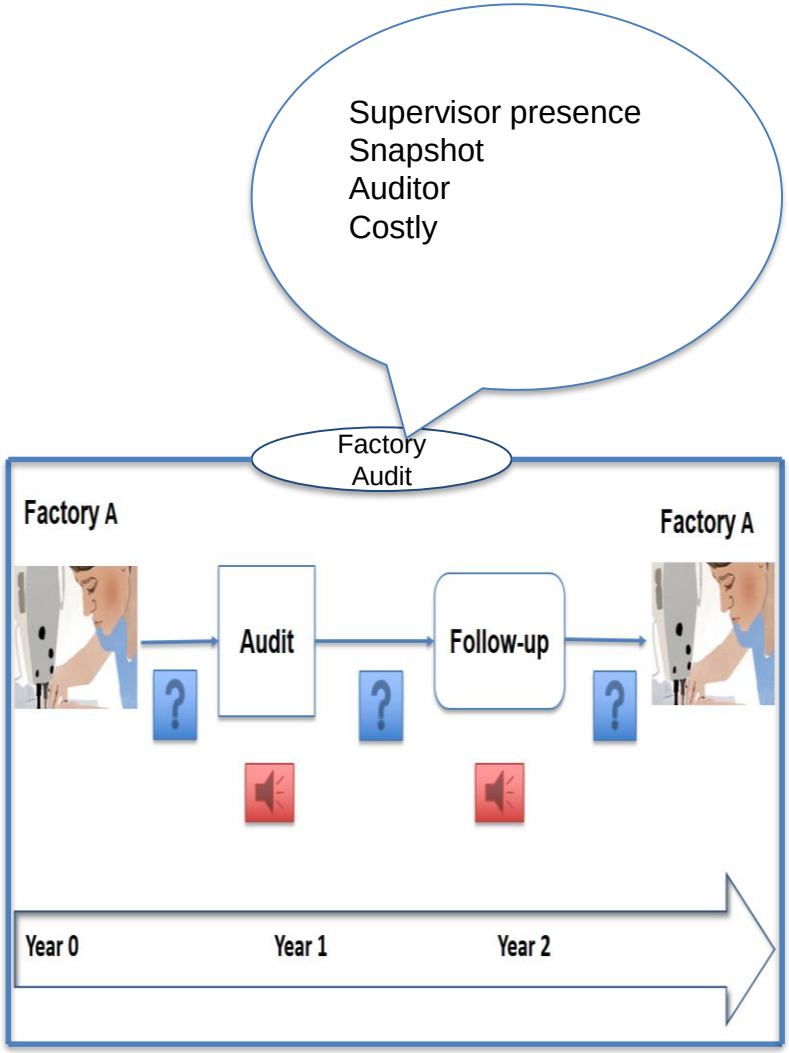
WORKER CROWDSOURCING VS. FACTORY AUDIT





Gill, Guzder, & Khanna (2014)

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Can we use workers feedback crowdsourcing to protect apparel factories from reputational damage?

- *RO1: To determine the association of factory characteristics (i.e., workers grievances and factory indicators) with the negative publicity of apparel factories*

- *RO2: To identify the differences between factories that received negative publicity and those that did not, based on factory characteristics*

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Research Objective 1:

RO1a: To determine whether the type of publicity is associated with **workers voluntarily providing feedback**.

RO1b: To determine whether **delay in wages** are related to negative publicity.

RO1c: To determine whether the **fire safety violations** are associated with negative publicity.

RO1d: To determine the relationship between the **level of sanitation** (both for **toilet and canteen**) and the type of publicity.

RO1e: To determine whether **workplace abuse** is associated with negative publicity.

RO1f: To determine whether **child labor** is related to negative publicity.

RO1g: To determine the relationship between no **worker recommendation** and type of publicity.

RO1h: To determine whether the type of publicity is associated with **long working hours**.

RO1i: To determine whether **forced overtime** is associated with negative publicity.

RO1j: To determine whether **FOA rights violation** is associated with negative publicity.

RO1k: To determine whether **clean water** is associated with the absence of negative publicity.

RO1l: To determine the relationship between the **type of brand-supplier relationship** and type of publicity.

RO1m: To determine the relationship between **cooperative inspection approach** and type of publicity.

RO1n: To determine the **certification status** associated with negative publicity.

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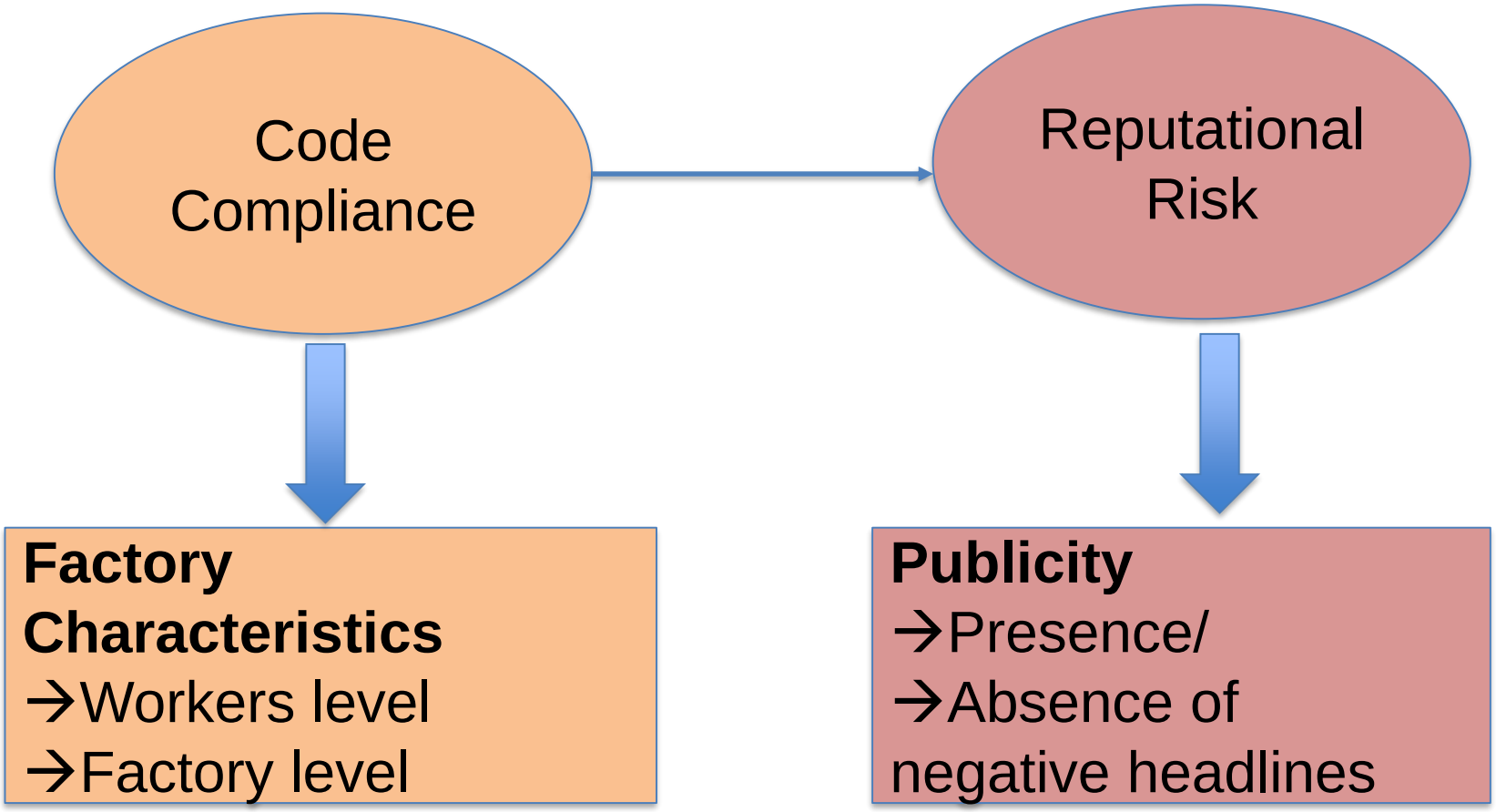
CONCEPTUAL FRAMEWORK



Short, Toffel, & Hugill (2016)

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Data

Source 1:

22290 responses → 194 factories → year 2016

Source 2:

Publicly available information → 194 factories → year 2016

Source 3:

Glocal newspaper articles → 194 factories → Jan 1, 2016 to Jan 31st , 2017

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Source 1: Workers Survey Responses

Independent Variables	Description	Response Type
Fire Exit	Are the fire exits in your factory always accessible at all times?	1 or 0
Overtime	Are you forced to work overtime in your factory to avoid non-payment and getting fired?	1 or 0
FOA	Are you free to join or form trade unions/worker welfare committees in your factory?	1 or 0
Clean Water	Do you have access to clean drinking water at your factory floor?	1 or 0
Feedback	If you have any other feedback on your factory, press 1 or else press 0	1 or 0
Long Hours	In the last month, have you ever worked more than 10 hours in a day?	1 or 0
Abuse	In the last month, have you experienced abuse from a manager, such as swearing, physical abuse, or sexual harassment?	1 or 0
Child Labor	In the last month, have you witnessed any child worker in your factory?	1 or 0
Wages	In the last month, were all your wages, including overtime hours, paid on time?	1 or 0
Sanitation Canteen	On a scale of 0 to 4, how would you rate the cleanliness of the canteen in the last month?	Likert Scale 0 to 4
Sanitation Toilet	On a scale of 0 to 4, how would you rate the cleanliness of the toilet in the last month?	Likert Scale 0 to 4
Recommendation	Will you recommend this factory to a friend or family member?	1 or 0

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Source 2: Publicly available information

Independent Variables	Description	Response Type
Certifications	1 if factory is certified by either one of WRAP, SA 8000, and WRC,, else 0	1 or 0
Buyer-Supplier Relationship	1 if supplier is tier 1 or tier 2 else 0	1 or 0
Cooperative Inspection	1 if brands paid feedback crowdsourcing service provider, or else 0	1 or 0
Headline	Presence or Absence of Negative Headline	1 or 0

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Source 3: Newspaper articles

CRITERIA FOR FINDING NEWS ARTICLES

Queries:

- ("Factory Name") AND (contentLocationCountry:Bangladesh OR sourceCountry:Bangladesh)
- ("Group Name") AND (contentLocationCountry:Bangladesh OR sourceCountry:Bangladesh)
- (Subject: Apparel & Fashion) AND (Industry: Labor & Employment) AND (contentLocationCountry:Bangladesh OR sourceCountry:Bangladesh)

News Database: Lexis Nexis News Desk
Publication type: Print and Online News media
Language: English
Timeline: Jan 01, 2016 to Jan 31, 2017

DATA PREPROCESSING

- Data Cleaning
- Data Splitting
- Data Transformation

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SURVEY QUESTIONS

Questions	Version 1	Version 2
1. Wages	Included	Included
2. Sanitation Toilet	Included	Included
3. Sanitation Canteen	Included	Not Included
4. Long Hours	Included	Not Included
5. Fire Safety	Included	Included
6. Abuse	Included	Included
7. Child Labor	Included	Included
8. Worker's Recommendation	Included	Not Included
9. Worker's Feedback	Included	Included
10. Clean Water	Not Included	Included
11. Forced Labor	Not Included	Included
12. FOA	Not Included	Included

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Variables included in the final four datasets

Datasets #	Level	Variables Included
1	Worker	Sanitation of Toilets, Worker Voluntary Feedback, Abuse, Child Labor, Wages, Fire Safety
2	Worker	Sanitation of Canteen, Long Working Hours, Worker Recommendation
3	Worker	FOA, Clean Water, Forced Overtime
4	Factory	Buyer Supplier Relationship, Certification, Cooperative Inspection

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Missing observations count

Factory Worker Survey Data	Before deleting observations			After deleting observations		
Column	Total	N. Missing	Percentage	Total	N. Missing	Percentage
FOA	7,973	255	3.198	7,973	255	3.198
Forced Overtime	7,973	54	0.677	7,973	54	0.677
Clean Water	7,973	1	0.012	7,973	1	0.012
Worker Recommendation	14,020	1104	7.874	12,980	64	0.493
Long Working Hours	14,020	910	6.497	12,980	9	0.069
Sanitation of Canteen	14,020	1505	10.734	12,980	455	3.51
Worker Voluntary Feedback	22,290	2340	10.497	20,952	1002	4.782
Child Labor	22,290	1938	8.694	20,952	600	2.863
Abuse	22,290	1684	7.554	20,952	346	1.651
Fire Safety	22,290	1560	6.998	20,952	222	1.059
Sanitation of Toilets	22,290	895	4.015	20,952	11	0.052
Wages	22,290	16	0.0717	20,952	16	0.076
Abuse Type	20,606	20311	91.123	20,606	11986	57.21

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Variables included in the final four datasets

Variables	Workers Responses	Interpretation	Approach
Worker voluntary feedback, Long working hours, Abuse, Child labor, and Forced overtime	Yes	Complains	Proportion
Worker recommendation, Wages, Fire safety, FOA, and Clean water	No	Complains	1- Proportion

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Details of the final four datasets used for the analysis of both research objectives

Research Objectives	Analyses	Dataset Name	Number of factories with negative headlines	Number of factories with absence of negative headlines
1	Stepwise Logistic Regression, Exact Logistic Regression, Bootstrap estimate using Stepwise Logistic Regression	Dataset 1	16	170
		Dataset 2	11	109
		Dataset 3	13	127
		Dataset 4	16	170
2	Worker response and Bar Charts	Dataset 1	16	170
		Dataset 2	11	109
		Dataset 3	13	127
		Dataset 4	16	170
	Issues Frequency Analysis, Sentiment Score	Open ended feedbacks	16 factories with 56 worker responses	109 factories with 566 worker responses

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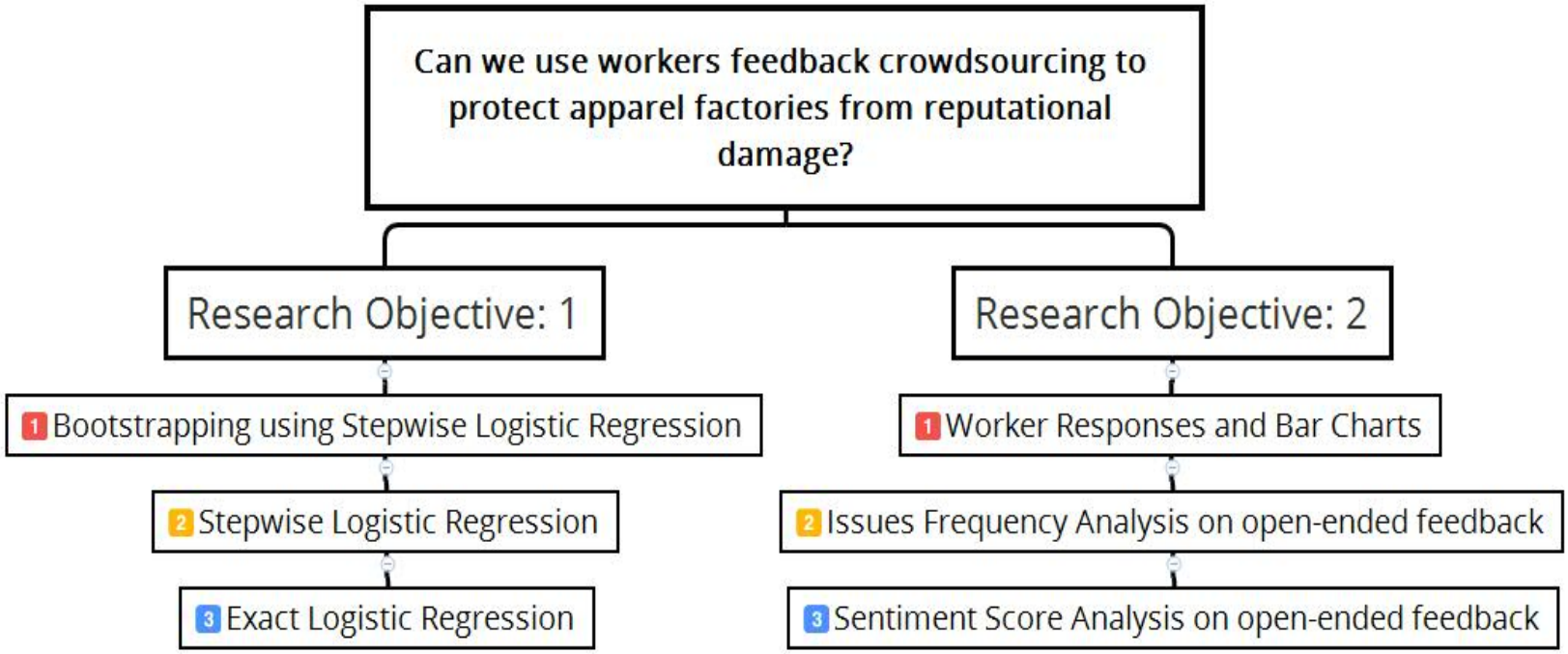
The organisation of analysis for both research objectives



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Bootstrap estimates distribution using stepwise logistic regression

Dataset #	Variables	Original N	N after stepwise	Mean	Std Dev	Minimum	Maximum
Dataset 1	Worker Voluntary Feedback	1000	24	-15.51	2.84	-21.22	-11.85
	Wages	1000	5	-6.11	1.12	-7.29	-4.83
	Fire Safety	1000	1	-4.38	.	-4.38	-4.38
	Sanitation of Toilets	1000	652	2.86	0.77	1.62	7.49
	Abuse	1000	0	.	.	.	.
	Child Labor	1000	0	.	.	.	.
Dataset 2	Worker Recommendation	1000	579	-5.4	1.29	-15.6	-3.31
	Long Working Hours	1000	11	9.02	3.55	6.3	19.28
	Sanitation of Canteen	1000	18	1.54	3.56	-5.8	4.59
Dataset 3	Forced Overtime	1000	94	6.52	1.85	4.01	14.7
	FOA	1000	8	3.78	0.4	3.37	4.65
	Clean Water	1000	1	-14.78	.	-14.78	-14.78
Dataset 4	Buyer-Supplier Relationship	1000	76	-2.34	0.03	-2.42	-2.30
	Cooperative Inspection	1000	124	-2.33	0.03	-2.42	-2.30
	Certification	1000	2	-2.22	0.03	-2.24	-2.19

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Sub-sampled Datasets

Dataset #	Independent Variables	Dependent Variable
Datasets 1: Worker-level responses Mod121, Mod122, Mod123, Mod124, Mod125, Mod12	Abuse, Child Labor, Fire Safety, Wages, Sanitation of Toilets, Worker Voluntary Feedback	Headline
Datasets 2: Worker-level responses Mod12lg1, Mod12lg2, Mod12lg3, Mod12lg4, Mod12lg5, Mod12lg	Sanitation of Canteen, Long Working Hours, Worker Recommendation	Headline
Datasets 3: Version 2 responses V31, V32, V33, V34, V35, V3	FOA, Forced Overtime, Clean Water	Headline
Datasets 4:Factory-level indicators Mod121, Mod122, Mod123, Mod124, Mod125, Mod12	Certification, Cooperative Inspection, Buyer-Supplier Relationship	Headline

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Stepwise Logistic Regression

Dataset #	Dataset Name	Variables In	Variables Out
Dataset 1	Mod121	Abuse, Child labor, Fire Safety, Wages, Sanitation of Toilets, Worker Voluntary Feedback	Sanitation of Toilets
	Mod122		Sanitation of Toilets
	Mod123		Sanitation of Toilets
	Mod124		Sanitation of Toilets
	Mod125		No variable selection
	Mod12		Sanitation of Toilets
Dataset 2	Mod12lg1	Sanitation of Canteen, Long Working Hours, Worker Recommendation	No variable selection
	Mod12lg2		Worker Recommendation
	Mod12lg3		Worker Recommendation
	Mod12lg4		Worker Recommendation
	Mod12lg5		No variable selection
	Mod12lg		Worker Recommendation

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Stepwise Logistic Regression

Dataset #	Dataset Name	Variables In	Variables Out
Dataset 3	V31	FOA, Forced Overtime, Clean Water	Forced Overtime
	V32		No variable selection
	V33		No variable selection
	V34		No variable selection
	V35		No variable selection
	V3		Forced Overtime
Dataset 4	Mod121	Certification, Cooperative Inspection, Buyer-Supplier relationship	No variable selection
	Mod122		No variable selection
	Mod123		No variable selection
	Mod124		No variable selection
	Mod125		No variable selection
	Mod12		Cooperative Inspection

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Parameter estimates from stepwise logistic regression

Dataset #	Dataset Name	Variables	Parameter estimates	Odds Ratio
1	Mod12, Mod121, Mod122, Mod123, Mod124	Sanitation of Toilets	1.7216, 3.8925, 2.7425 , 2.9301, 1.8581	5.593, 48.91, 15.48, 18.72, 6.411
2	Mod12lg, Mod12lg2, Mod12lg3, Mod12lg4	Worker Recommendation	-4.0848, -4.5038 , -3.5943 ,-6.4907	0.96, , 0.955, 0.964, 0.937
3	V3, V31	Forced Overtime	1.6988, 4.6730	1.01, 1.047
4	Mod12	Cooperative Inspection	-1.3122	0.9869

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Exact Logistic Regression

Dataset #	Dataset Name	Variables In	Variables Out
Dataset 1	Mod121	Sanitation of Toilets	*Error: Not sufficient Memory
	Mod122	Sanitation of Toilets	*Error: Not sufficient Memory
	Mod123	Sanitation of Toilets	*Error: Not sufficient Memory
	Mod124	Sanitation of Toilets	*Error: Not sufficient Memory
	Mod125	No variable selection	No variable selection
	Mod12	Sanitation of Toilets	*Error: Not sufficient Memory
Dataset 2	Mod12lg1	Sanitation of Canteen	Sanitation of Canteen
	Mod12lg2	Worker Recommendation	Worker Recommendation
	Mod12lg3	Worker Recommendation	Worker Recommendation
	Mod12lg4	Worker Recommendation	*Error: Not sufficient Memory
	Mod12lg5	No variable selection	No variable selection
	Mod12lg	Worker Recommendation	Worker Recommendation

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Exact Logistic Regression

Dataset #	Dataset Name	Variables In	Variables Out
Dataset 3	V31	Forced Overtime	Forced Overtime
	V32	Forced Overtime, Clean Water	Forced Overtime
	V33	Forced Overtime	*Error: Not sufficient Memory
	V34	No variable selection	No variable selection
	V35	Forced Overtime	No information because of insignificant global null hypothesis test p-value
	V3	Forced Overtime	Forced Overtime
Dataset 4	Mod121	Certification, Cooperative Inspection	Cooperative Inspection
	Mod122	Cooperative Inspection, Buyer-Supplier Relationship	Cooperative Inspection, Buyer-Supplier Relationship
	Mod123	Cooperative Inspection, Certification	Cooperative Inspection
	Mod124	No variable selection	No variable selection
	Mod125	Certification, Buyer-Supplier Relationship	No information because of insignificant global null hypothesis test p-value
	Mod12	Cooperative Inspection, Certification	Cooperative Inspection

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Parameter estimates from Exact Logistic regression

Dataset #	Dataset Name	Variables	Exact Conditional Test Score Test P - Value	Exact Parameter estimates	Odds Ratio
2	Mod12lg1, Mod12lg	Sanitation of Canteen	0.0375, 0.0375	2.4402, 2.4402	11.47, 11.47
	Mod12lg Mod12lg2, Mod12lg3	Worker Recommendation	0.0380, 0.0173, 0.0305	-4.127, -4.3603, -3.4768	0.959, 0.957, 0.966
3	V3, V31, V32	Forced Overtime	0.0056, 0.0056, 0.0286	4.5301, 4.5301, 15.4397,	1.046, 1.046, 1.166
	V32	Clean Water	0.0769	Not applicable	Not applicable
4	Mod12, Mod121, Mod122, Mod123	Cooperative Inspection	0.0480, 0.0394, 0.0124, 0.0406	-1.3559, -2.2195, -2.5489, -2.1955	0.257, 0.108, 0.078, 0.111
	Mod122	Buyer-Supplier Relationship	0.0489	-2.33	0.0972
	Mod 12, Mod121, Mod123	Certification	0.2,0.1076, 0.1923	Not applicable	Not applicable

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Summary of logistic regression analysis

Variables	Dataset	Bootstrap	Stepwise logistic Regression	Exact	Comment
Worker Voluntary Feedback	1	Negative estimate	No variable selection	No variable selection	No contradiction
Wages		Negative estimate	No variable selection	No variable selection	No contradiction
Fire Safety		Negative estimate	No variable selection	No variable selection	No contradiction
Sanitation of Toilets		Positive estimate	Positive estimate	Unable to calculate because of not enough memory	No contradiction
Abuse		Lack of Significance	No variable selection	No variable selection	Lack of Significance
Child Labor		Lack of Significance	No variable selection	No variable selection	Lack of Significance
Worker Recommendation	2	Negative estimate	Negative estimate	Negative estimate	Consistent
Long Working Hours		Positive estimate	No variable selection	No variable selection	No contradiction
Sanitation of Canteen		Lack of Significance	No variable selection	Positive estimate	Contradiction
Forced Overtime	3	Positive estimate	Positive estimate	Positive estimate	Consistent
FOA		Positive estimate	No variable selection	No variable selection	No contradiction
Clean Water		Negative estimate	No variable selection	Not Significant	Contradiction
Buyer-Supplier Relationship	4	Negative estimate	No variable selection	Negative estimate	Consistent
Cooperative Inspection		Negative estimate	Negative estimate	Negative estimate	Consistent
Certification		Negative estimate	No variable selection	Not Significant	Contradiction

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Research Objective 1:

RO1a: To determine whether the type of publicity is associated with **workers voluntarily providing feedback**.

RO1b: To determine whether **delay in wages** are related to negative publicity.

RO1c: To determine whether the **fire safety violations** are associated with negative publicity.

RO1d: To determine the relationship between the **level of sanitation** (both for **toilet and canteen**) and the type of publicity.

RO1e: To determine whether **workplace abuse** is associated with negative publicity.

RO1f: To determine whether **child labor** is related to negative publicity.

RO1g: To determine the relationship between no **worker recommendation** and type of publicity.

RO1h: To determine whether the type of publicity is associated with **long working hours**.

RO1i: To determine whether **forced overtime** is associated with negative publicity.

RO1j: To determine whether **FOA rights violation** is associated with negative publicity.

RO1k: To determine whether **clean water inaccessibility** is associated with the negative publicity.

RO1l: To determine the relationship between the **type of brand-supplier relationship** and type of publicity.

RO1m: To determine the relationship between **cooperative inspection approach** and type of publicity.

RO1n: To determine the **certification status** associated with negative publicity.

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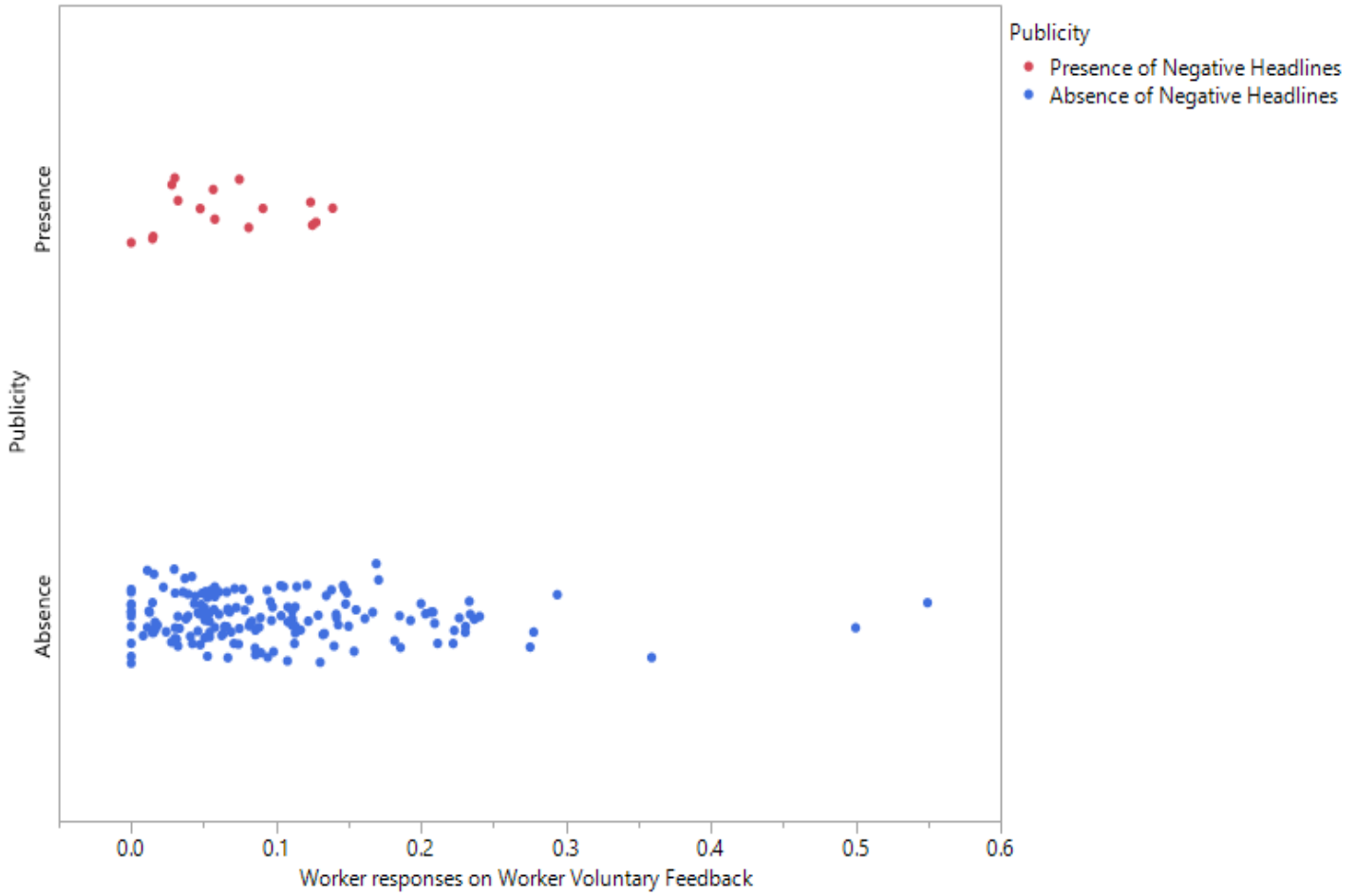
Worker Voluntary Feedback



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Worker Voluntary Feedback

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Worker Voluntary Feedback	Range of negative estimate (i.e., -21.22 to -11.85)	No selection	No selection

RO1a: To determine whether the type of publicity is associated with workers voluntarily providing feedback.

The statistical analysis did not provide evidence of the association between workers' willingness to participate in a voluntary open-ended survey question about an apparel factory and negative publicity.

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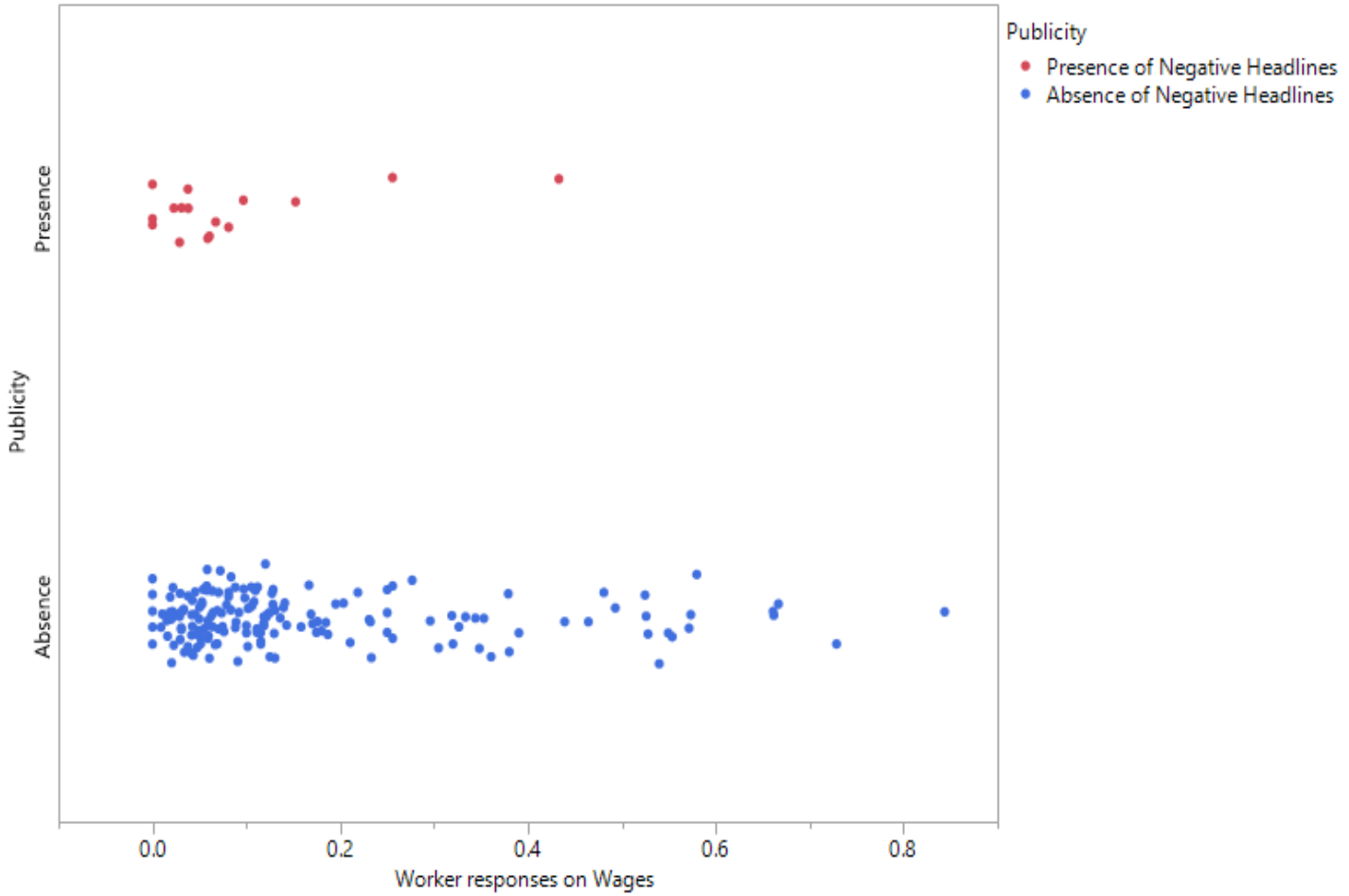
Wages



Wages

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Wages	Range of negative estimate (i.e., -7.29 to -4.83)	No selection	No selection

RO1b: To determine whether delay in wages are related to negative publicity

The statistical analysis did not provide evidence of the association between a delay in wages in an apparel factory and negative publicity.

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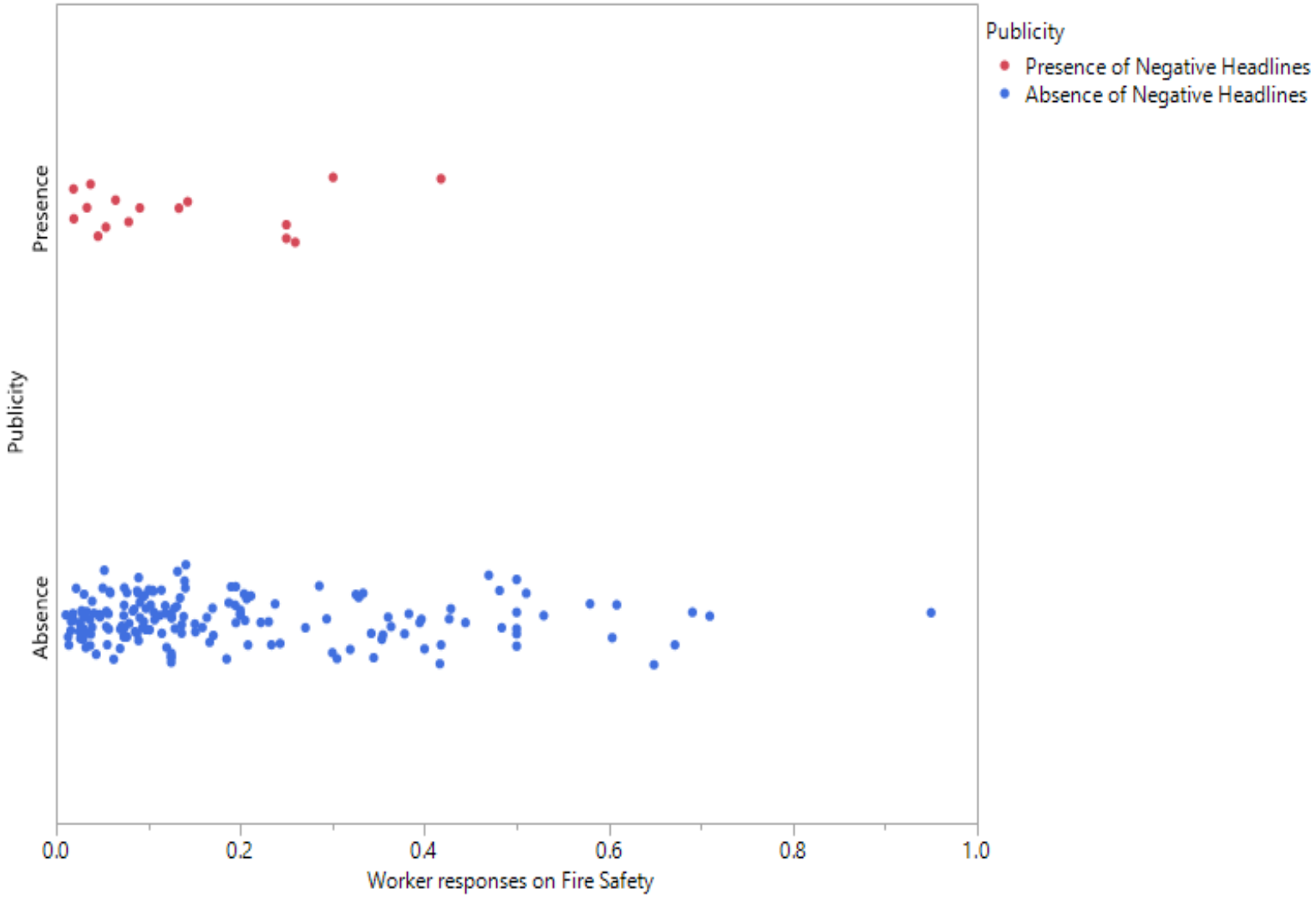
Fire Safety



Fire Safety

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Fire Safety	Range of negative estimate (i.e., -4.38 to -4.38)	No selection	No selection

RO1c: To determine whether fire safety violations are associated with negative publicity.

The statistical analysis did not provide evidence of the association between fire safety violations in an apparel factory and negative publicity.

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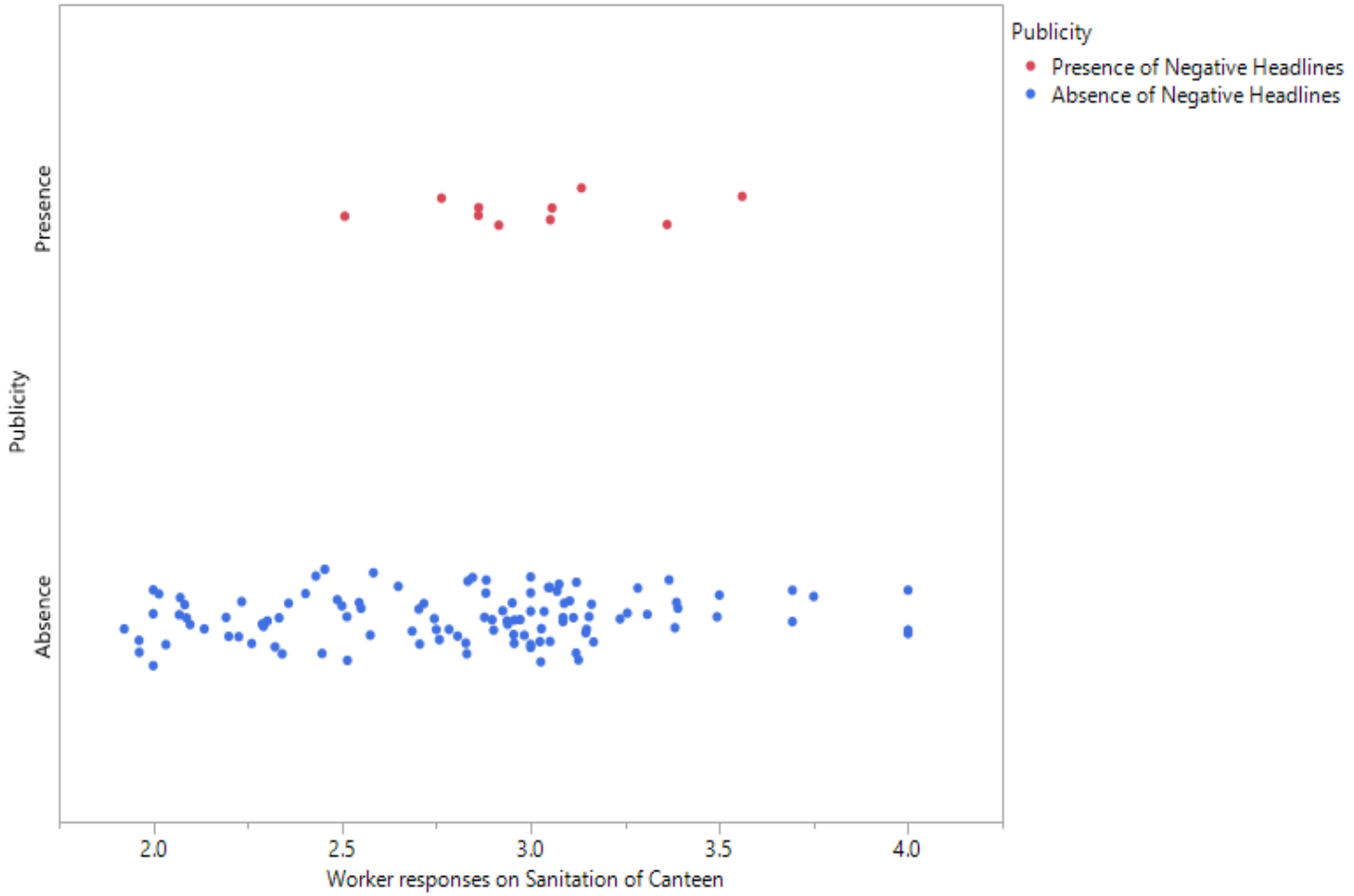
Sanitation of Canteen



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Sanitation of Canteen

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Sanitation of Canteen	Can be either positive or negative as estimate 0 fall within the distribution (i.e., -5.8 to 4.5)	Positive estimate (2.4402) and odds ratio of greater than 1. (i.e.,11.47)	No selection

RO1d: To determine the relationship between the level of sanitation (for canteen) and the type of publicity.

The statistical analysis did not provide evidence of the association between poor sanitation conditions of canteen and negative publicity.

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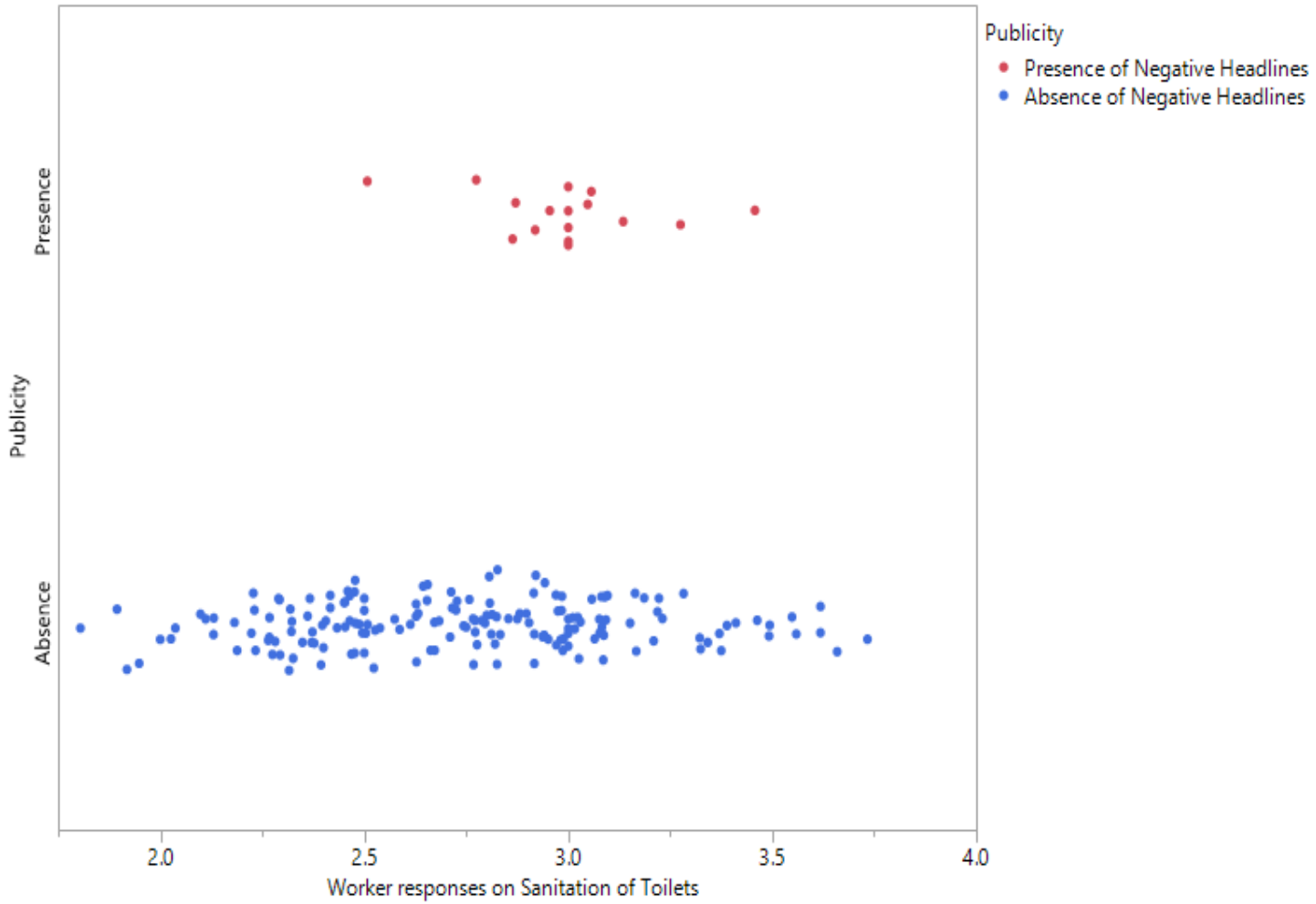
Sanitation of Toilets



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Sanitation of Toilets

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Sanitation of Toilets	Range of positive estimate (i.e., 1.62 to 7.49)	Unable to calculate because of not enough memory.	Positive estimate (1.7216) and odds ratio of greater than 1. (i.e., 5.59)

RO1d: To determine the relationship between the level of sanitation (for toilets) and the type of publicity.

The statistical analysis did not provide evidence of the association between poor sanitation conditions of the toilets and negative publicity.

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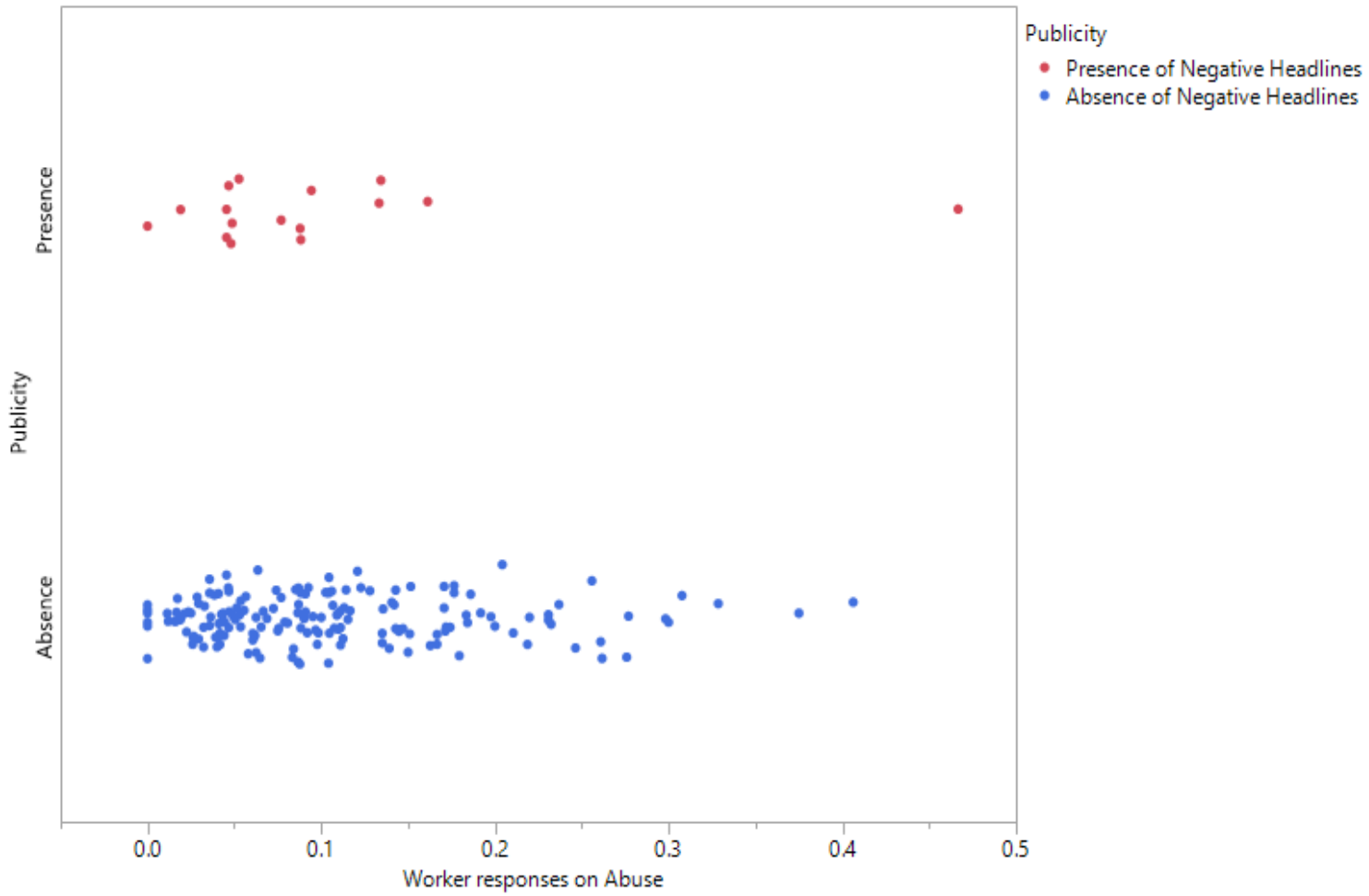
Abuse



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Abuse

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Abuse	Lack of Significance	No Selection.	No Selection

RO1e: To determine whether workplace abuse is associated with negative publicity.

The statistical analysis did not provide evidence of the association between abusive working conditions and negative publicity.

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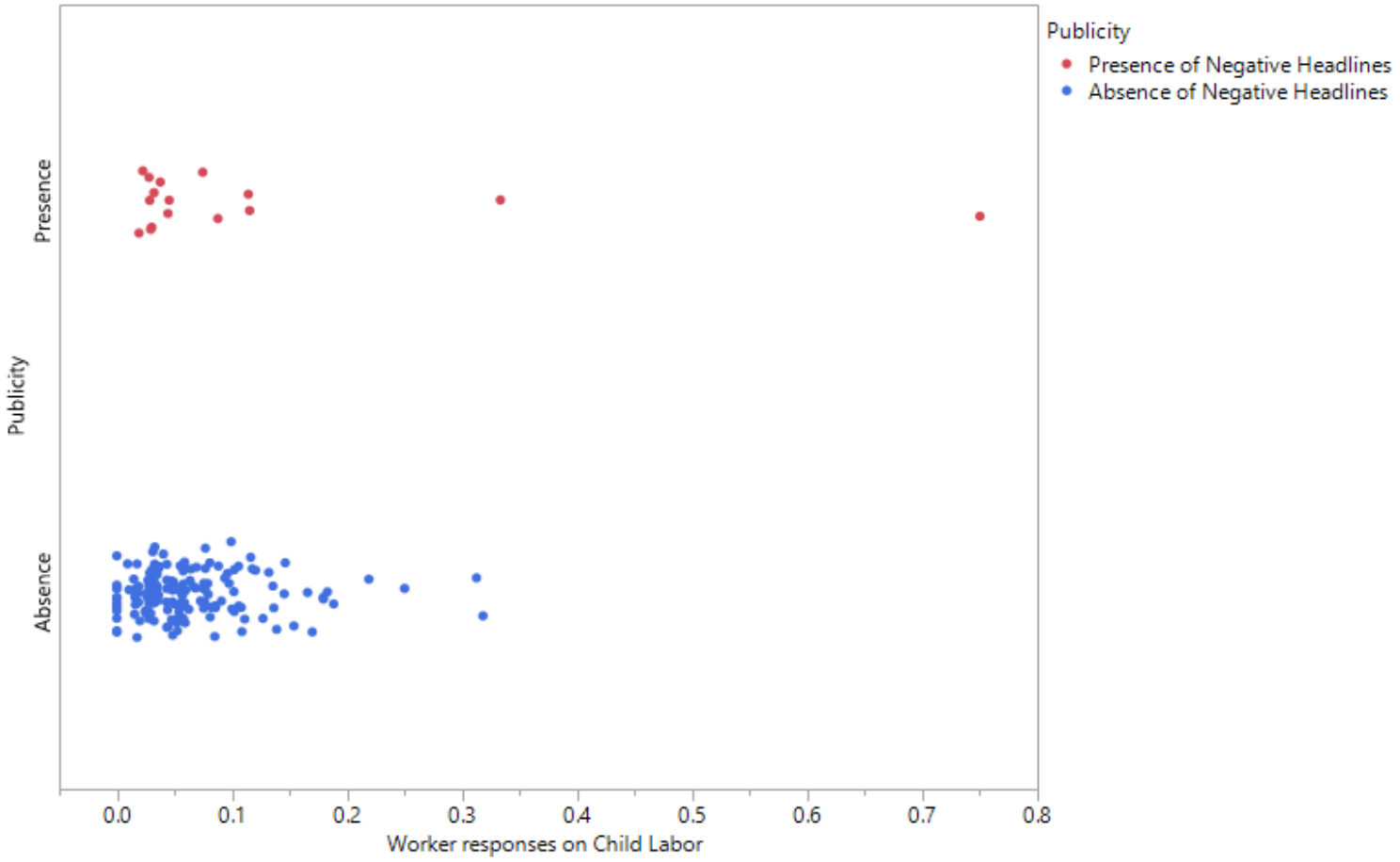
Child Labor



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Child Labor

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Child Labor	Lack of Significance	No Selection.	No Selection.

RO1f: To determine whether child labor is related to negative publicity

The statistical analysis did not provide evidence of the association between child labor presence inside an apparel factory and negative publicity.

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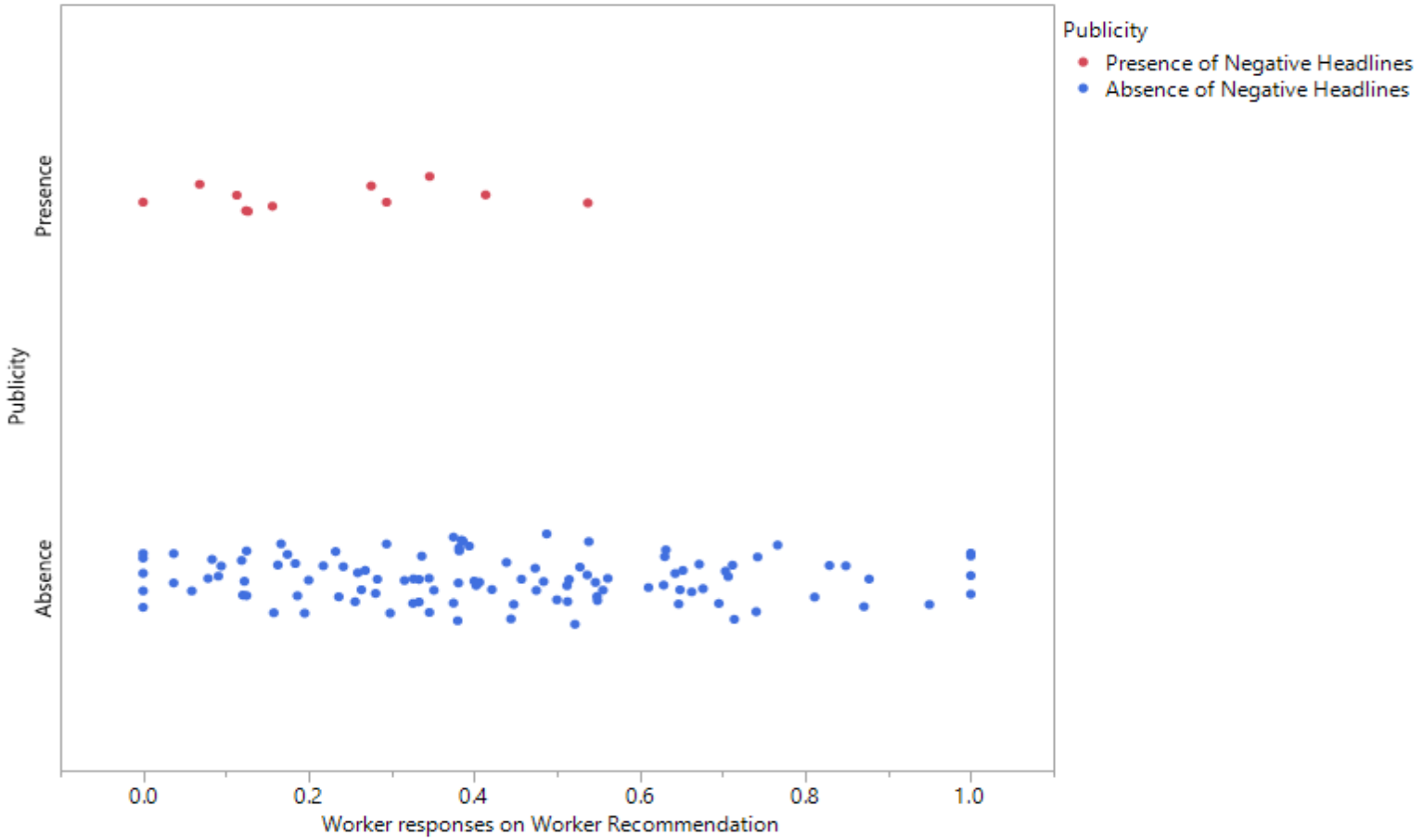
Worker Recommendation



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Worker Recommendation

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Worker Recommendation	Range of negative estimate (i.e., -15.6 to -3.3)	Negative estimate (-4.127) and odds ratio of less than 1. (i.e., 0.959)	Negative estimate (-4.0848) and odds ratio of less than 1. (i.e., 0.9599)

RO1g: To determine the relationship between no worker recommendation and type of publicity.

The statistical analysis did not provide evidence of the association between no worker recommendation and negative publicity.

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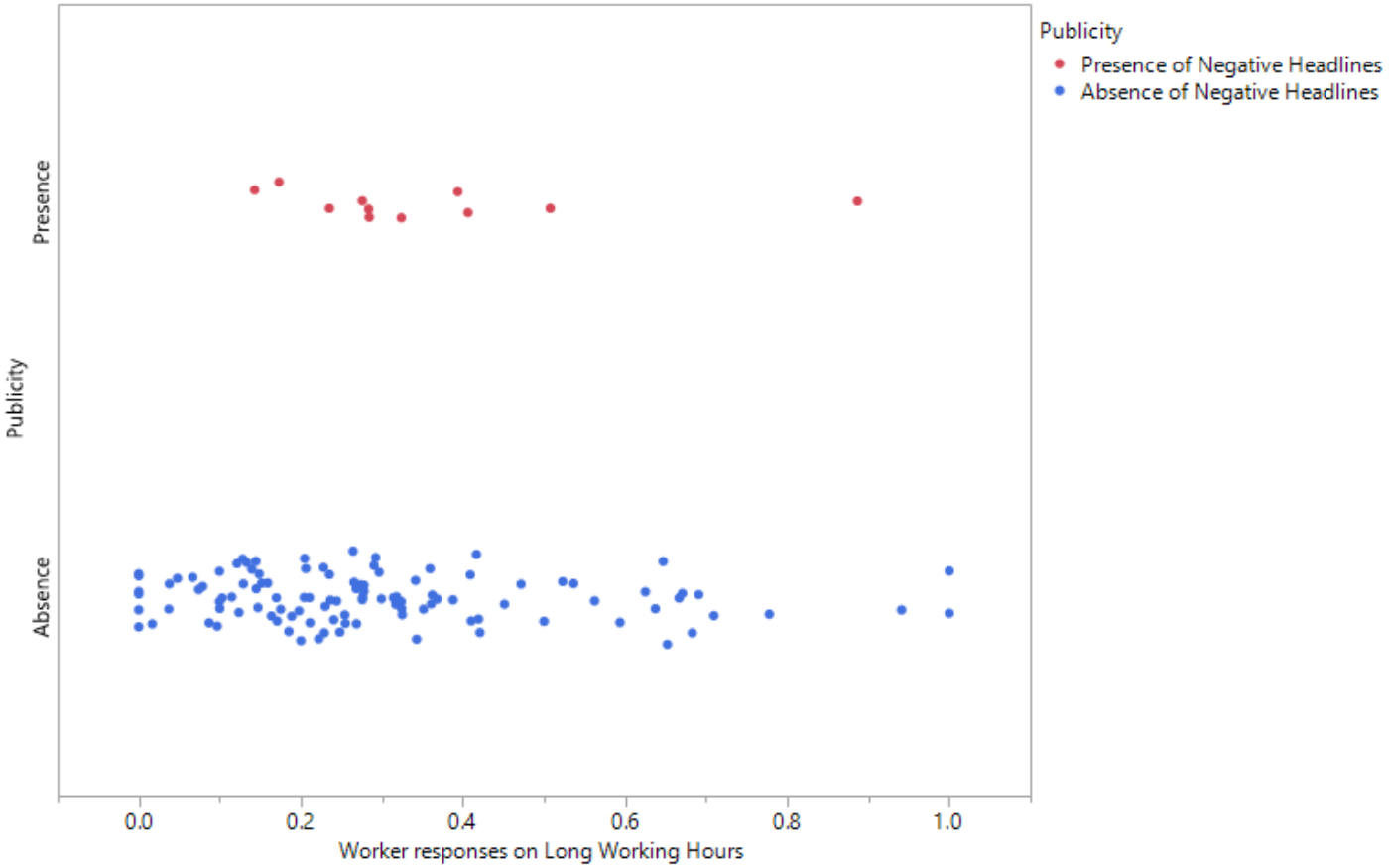
Long Working Hours



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Long Working Hours

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Long Working Hours	Range of positive estimate (i.e., 6.3 to 19.28)	No selection	No selection

RO1h: To determine whether the type of publicity is associated with long working hours.

The statistical analysis did provide evidence of the association between long working hours in an apparel factory and negative publicity.

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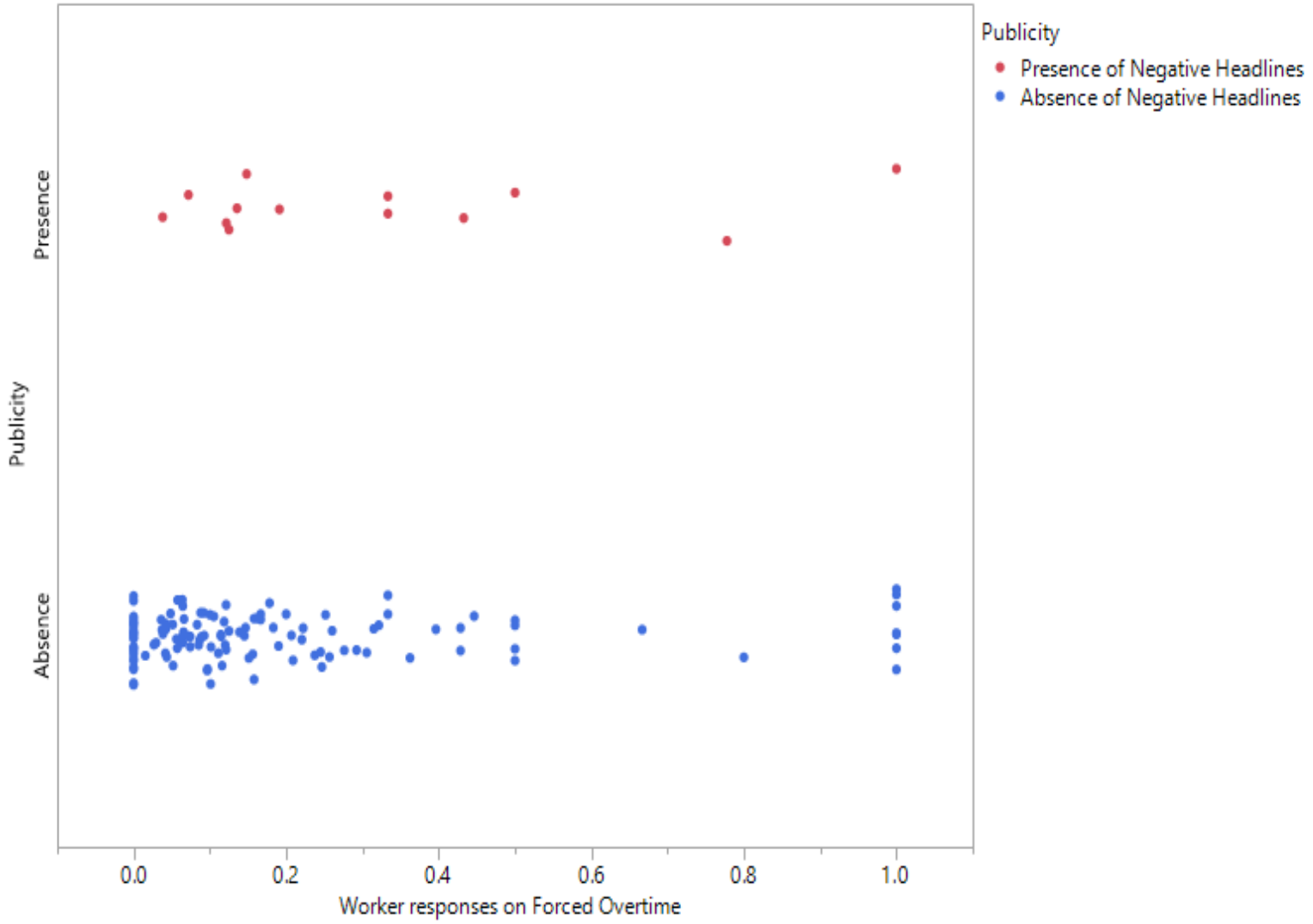
Forced Overtime



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Forced Overtime

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Forced Overtime	Range of positive estimate (i.e., 4.01 to 14.7)	Positive estimate (4.53) and odds ratio of greater than 1. (i.e., 1.046)	Positive estimate (1.6988) and odds ratio of greater than 1. (i.e., 1.0171)

RO1i: To determine whether forced overtime is associated with negative publicity

The statistical analysis did provide evidence of the association between forced overtime inside an apparel factory and negative publicity.

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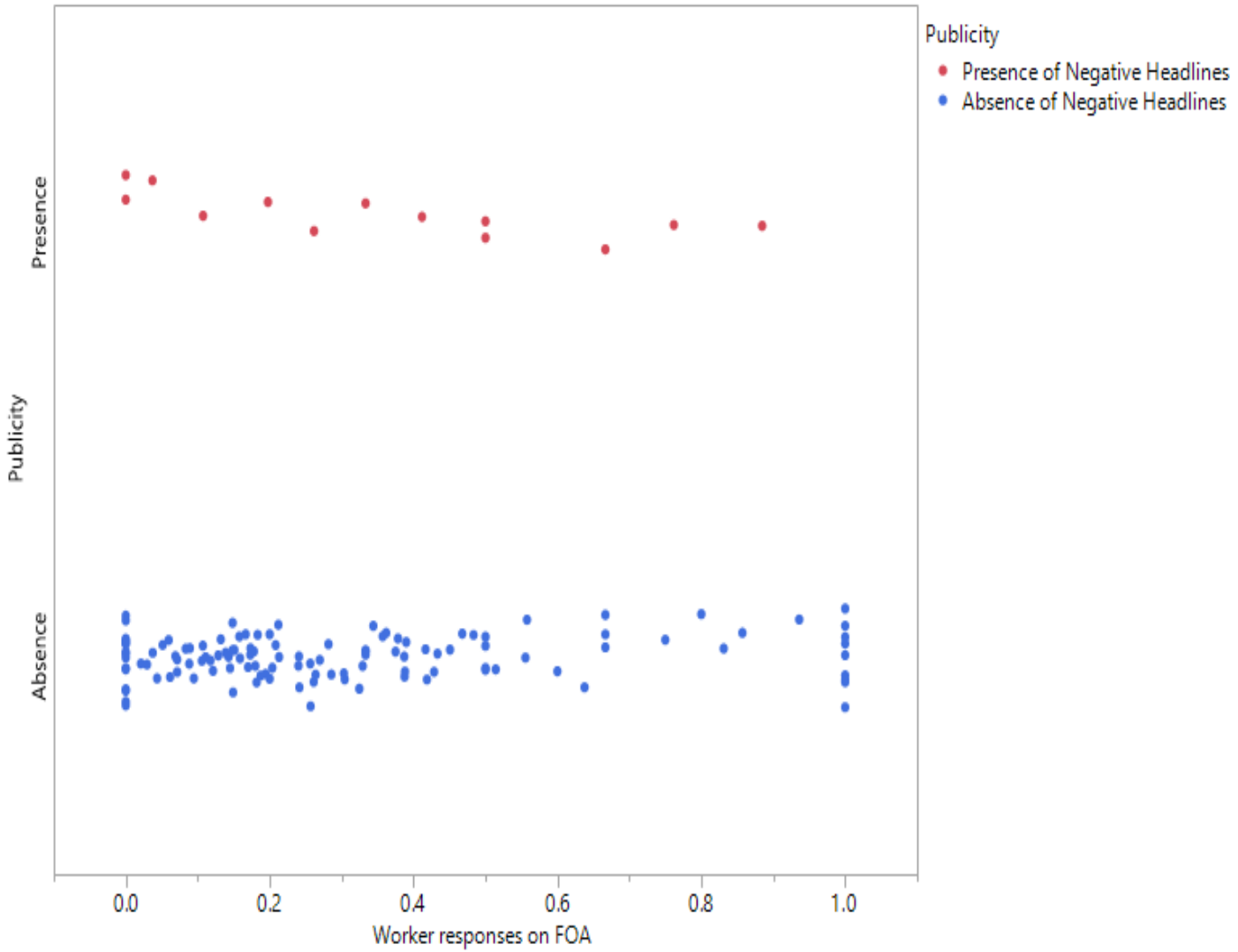
FOA



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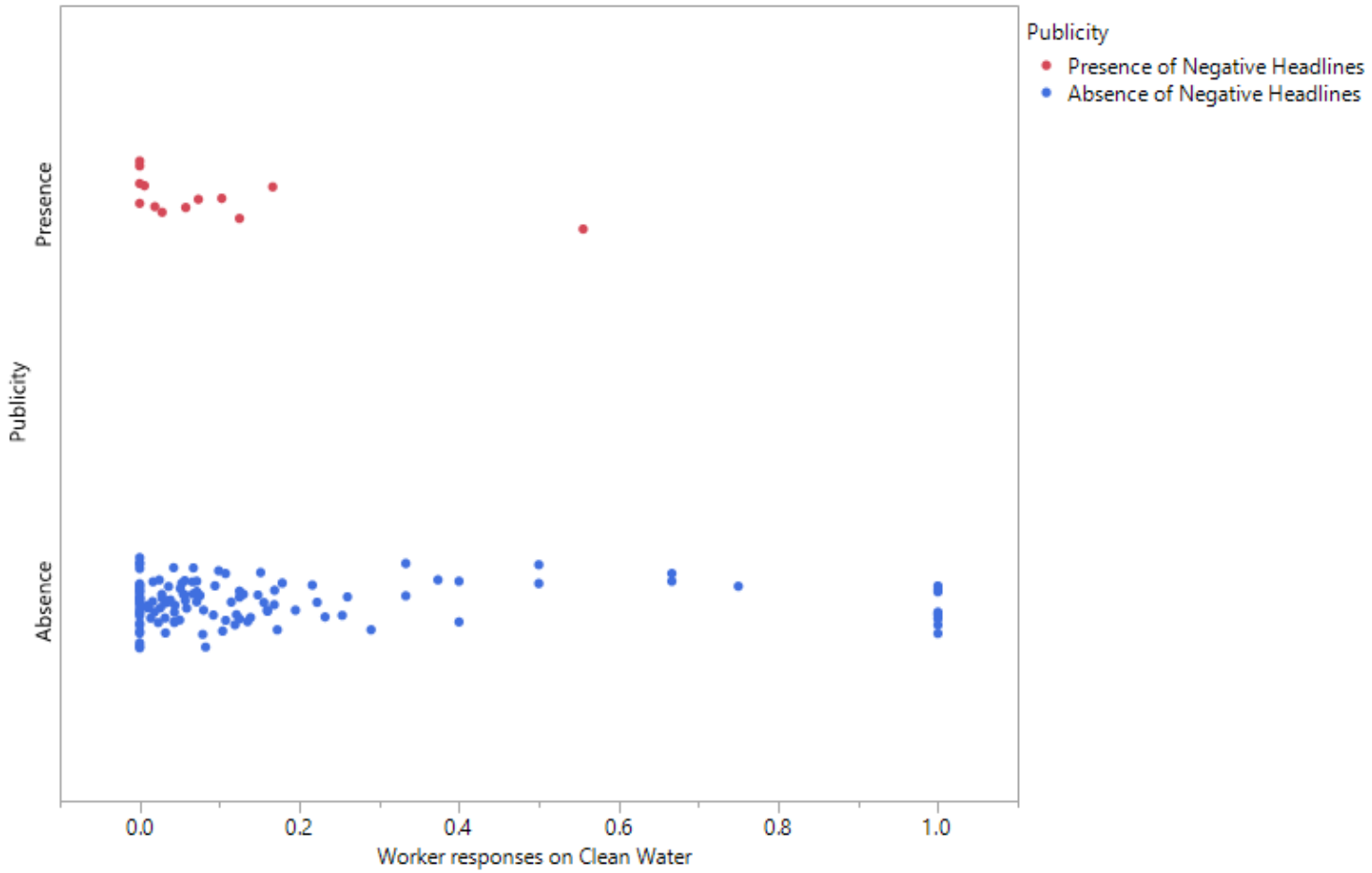
FOA

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
FOA	Range of positive estimate (i.e., 3.37 to 4.65)	No selection	No selection

RO1j: To determine whether FOA rights violation is associated with negative publicity.

The statistical analysis did provide evidence of the association between FOA rights violation inside apparel factory and negative publicity.

Clean Water


Publicity
Presence of Negative Headlines
Absence of Negative Headlines
Publicity
Presence
Absence
0.0
0.2
0.4
0.6
0.8
1.0
Worker responses on Clean Water

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Clean Water

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Clean Water	Range of negative estimate (i.e., -14.78 to -14.78)	Lack of Significance as score test p value was greater than 0.05(i.e., 0.0769)	No variable selection

RO1k: To determine whether clean water inaccessibility is associated with the negative publicity.

The statistical analysis did not provide evidence of the association between clean water inaccessibility inside an apparel factory and negative publicity.

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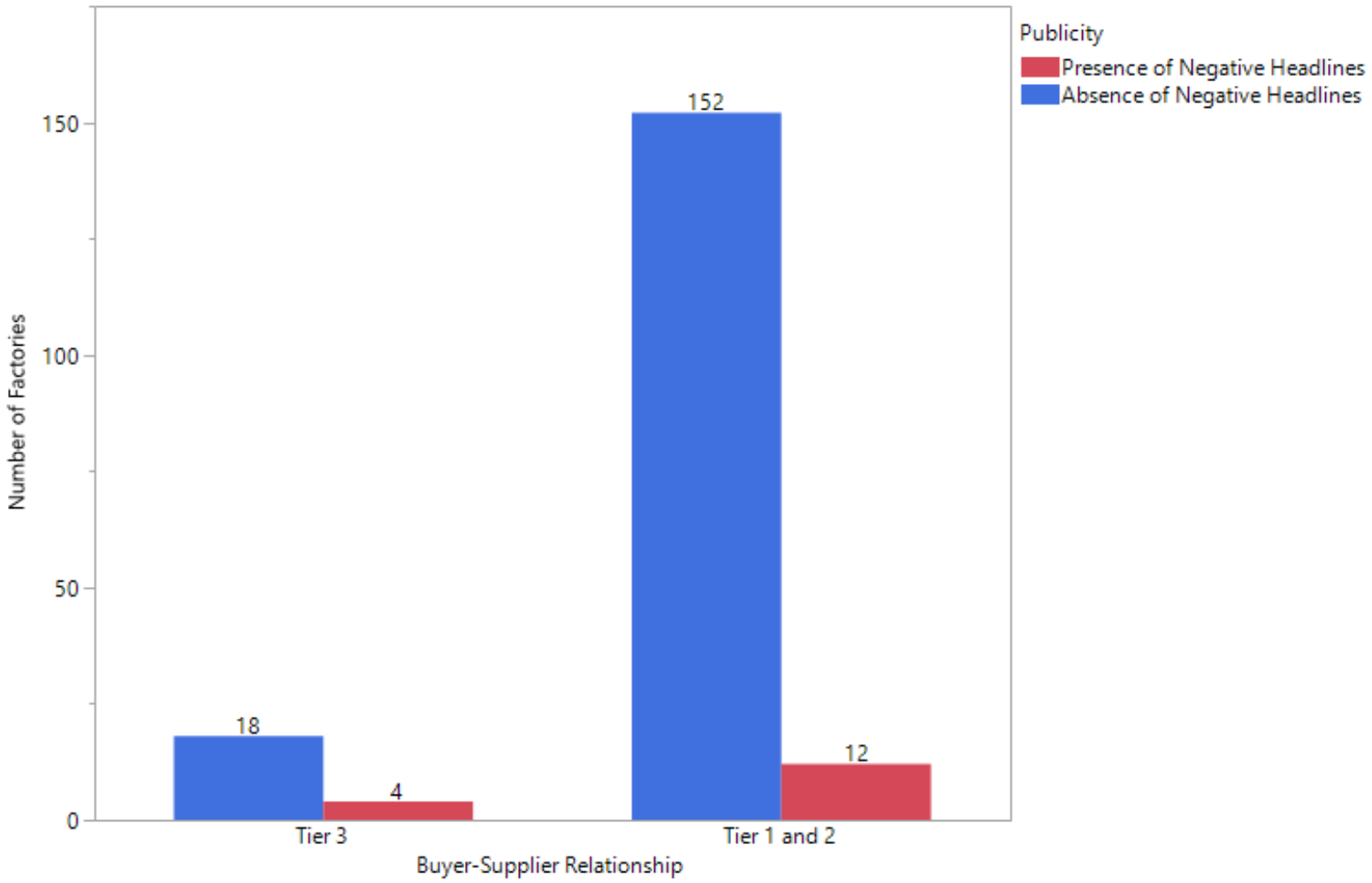
Buyer-Supplier Relationship



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Buyer-Supplier Relationship

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Buyer-Supplier Relationship	Range of negative estimate (i.e., -2.42 to -2.3)	Negative estimate (-2.33) and odds ratio of less than 1. (i.e., 0.097)	No variable selection

RO1l: To determine the relationship between the type of brand-supplier relationship and type of publicity.

The statistical analysis did provide evidence of the association between strong buyer-supplier relationship and the absence of negative publicity.

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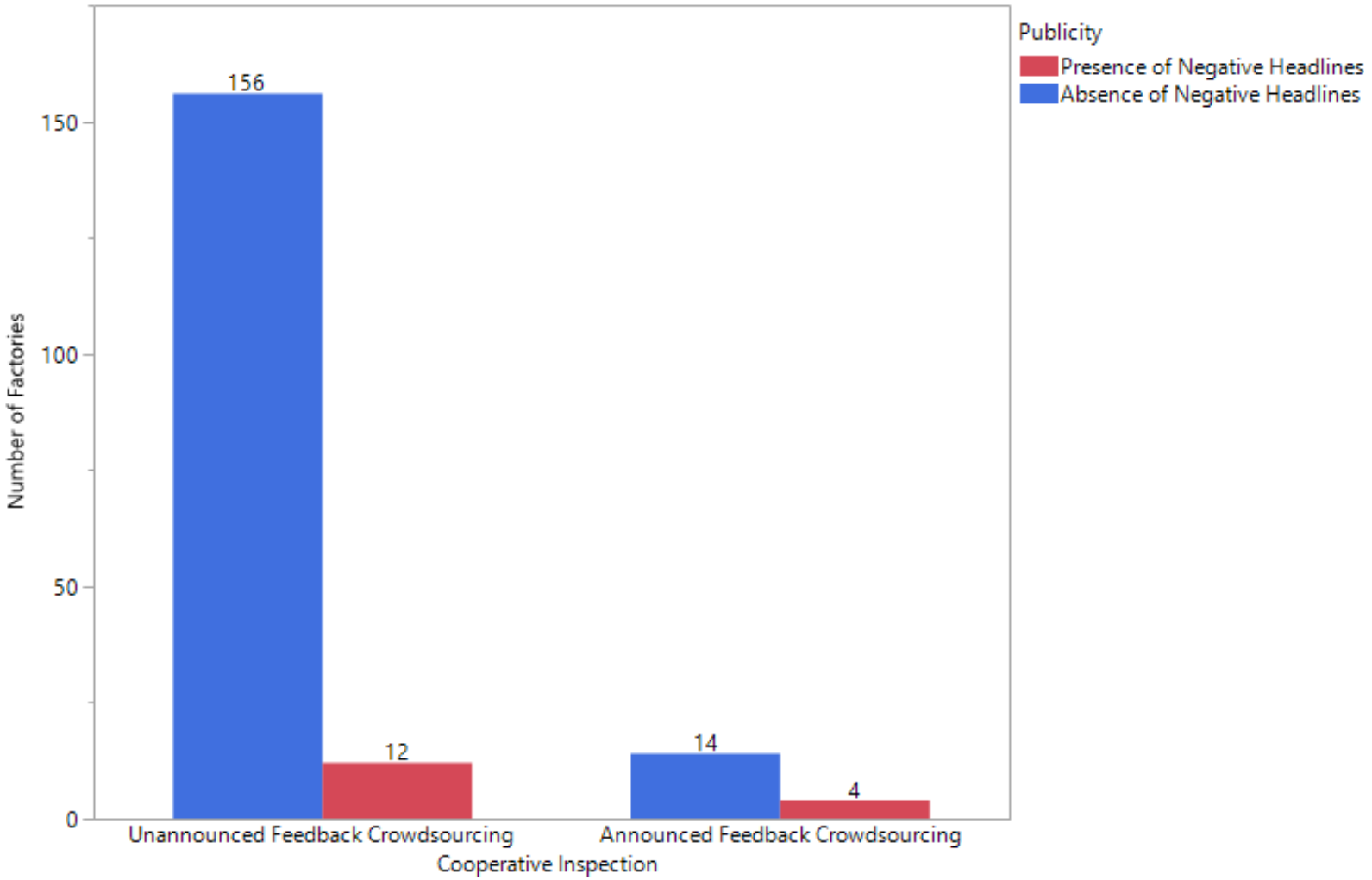
Cooperative Inspection



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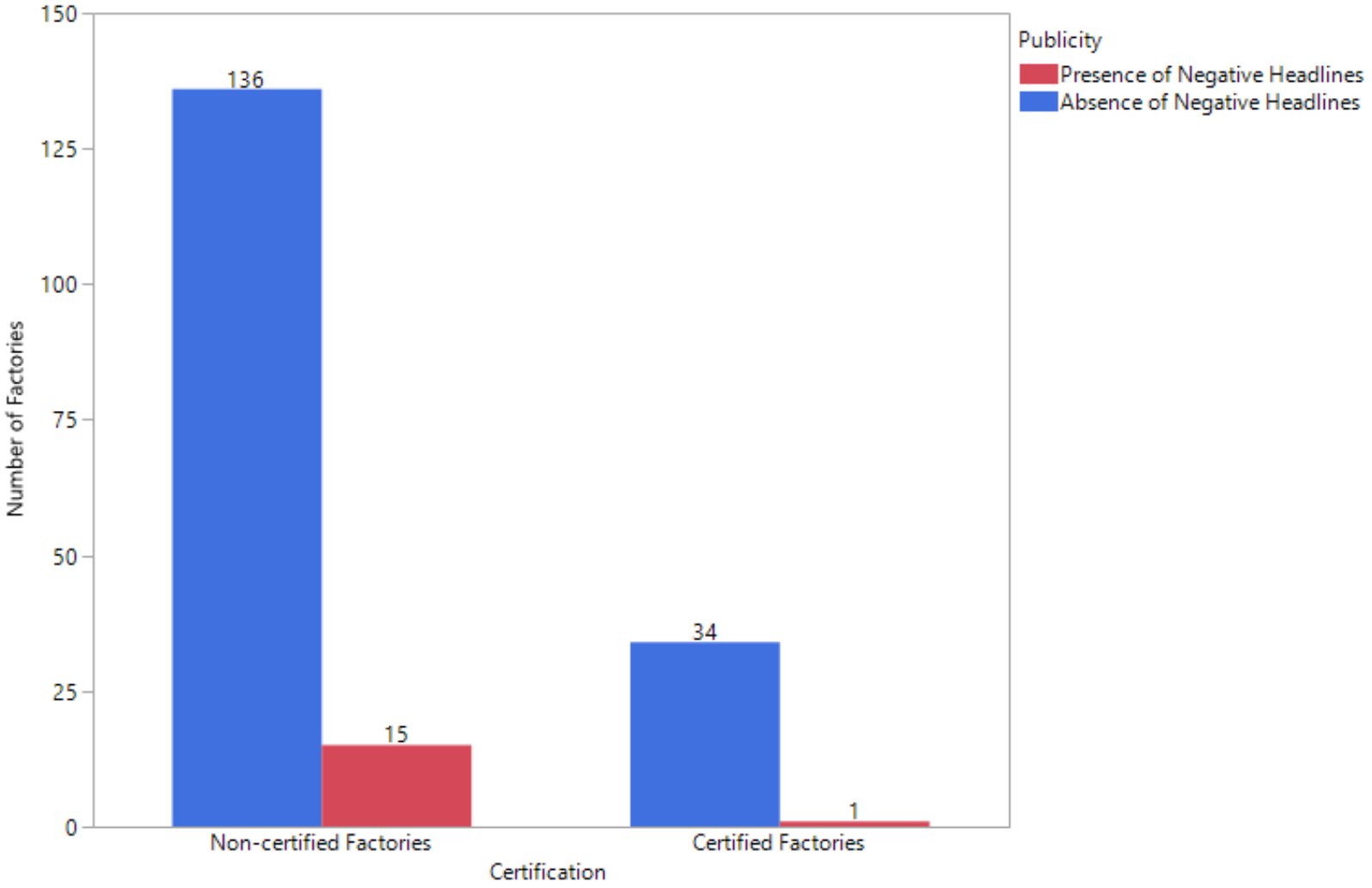
Cooperative Inspection

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Cooperative Inspection	Range of negative estimate (i.e., -2.42 to -2.30)	Negative estimate (-1.3559) and odds ratio of less than 1. (i.e., 0.257)	Negative estimate (-1.3122) and odds ratio of less than 1. (i.e., 0.269)

RO1m: To determine the relationship between cooperative inspection approach and type of publicity.

The statistical analysis did provide evidence of the association between announced feedback crowdsourcing and the absence of negative publicity.

Certification



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Certification

Variables	Stepwise Logistic Regression findings based on bootstrap sampling	Exact Logistic Regression findings	Stepwise Logistic Regression findings
Certification	Range of negative estimate (i.e., -2.24 to -2.19)	Lack of Significance as score test p value was greater than 0.05(i.e., 0.2)	No variable selection

RO1n: To determine the certification status associated with negative publicity.

The statistical analysis did not provide evidence of the association between certification status and negative publicity.

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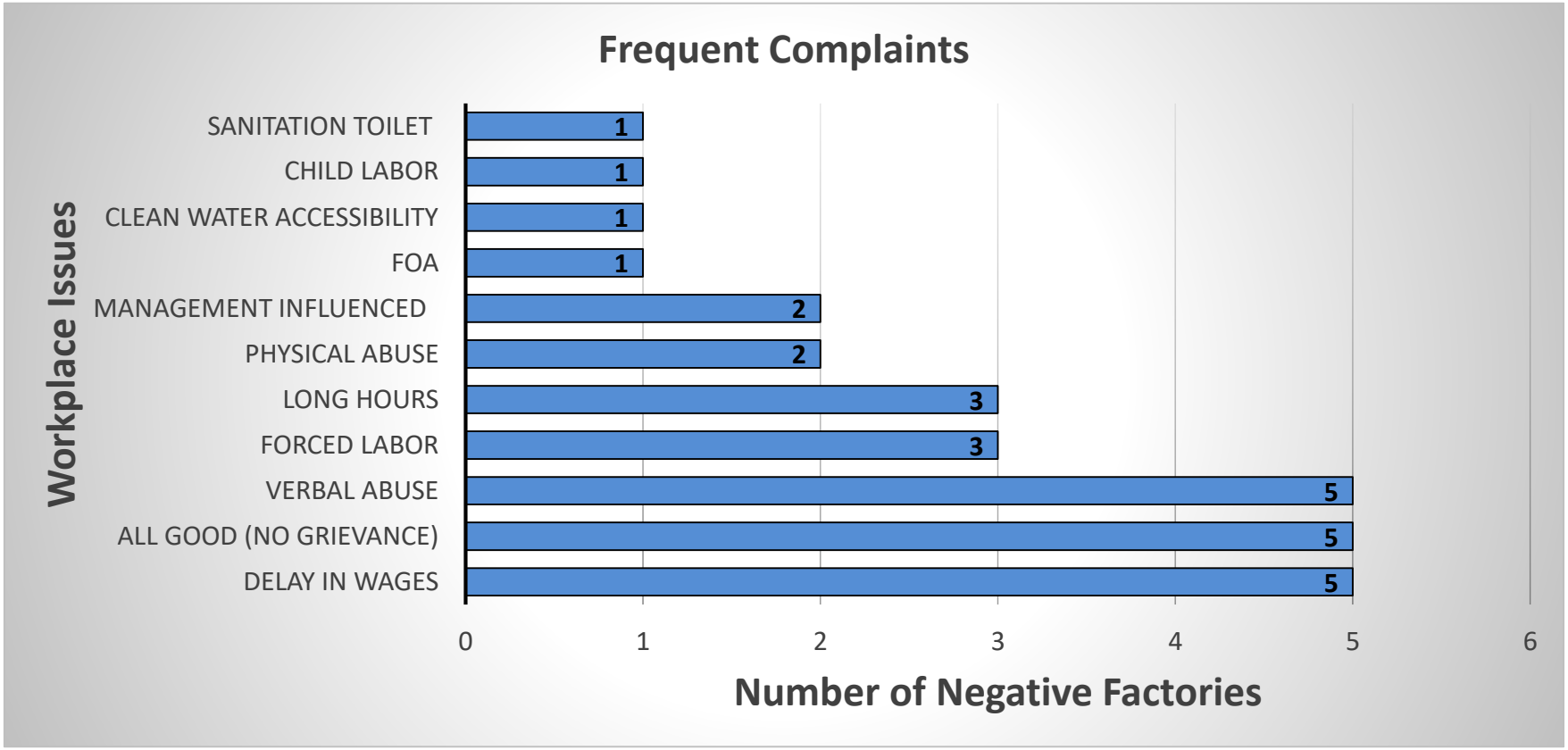
RO2: Prominent issues leading to negative publicity



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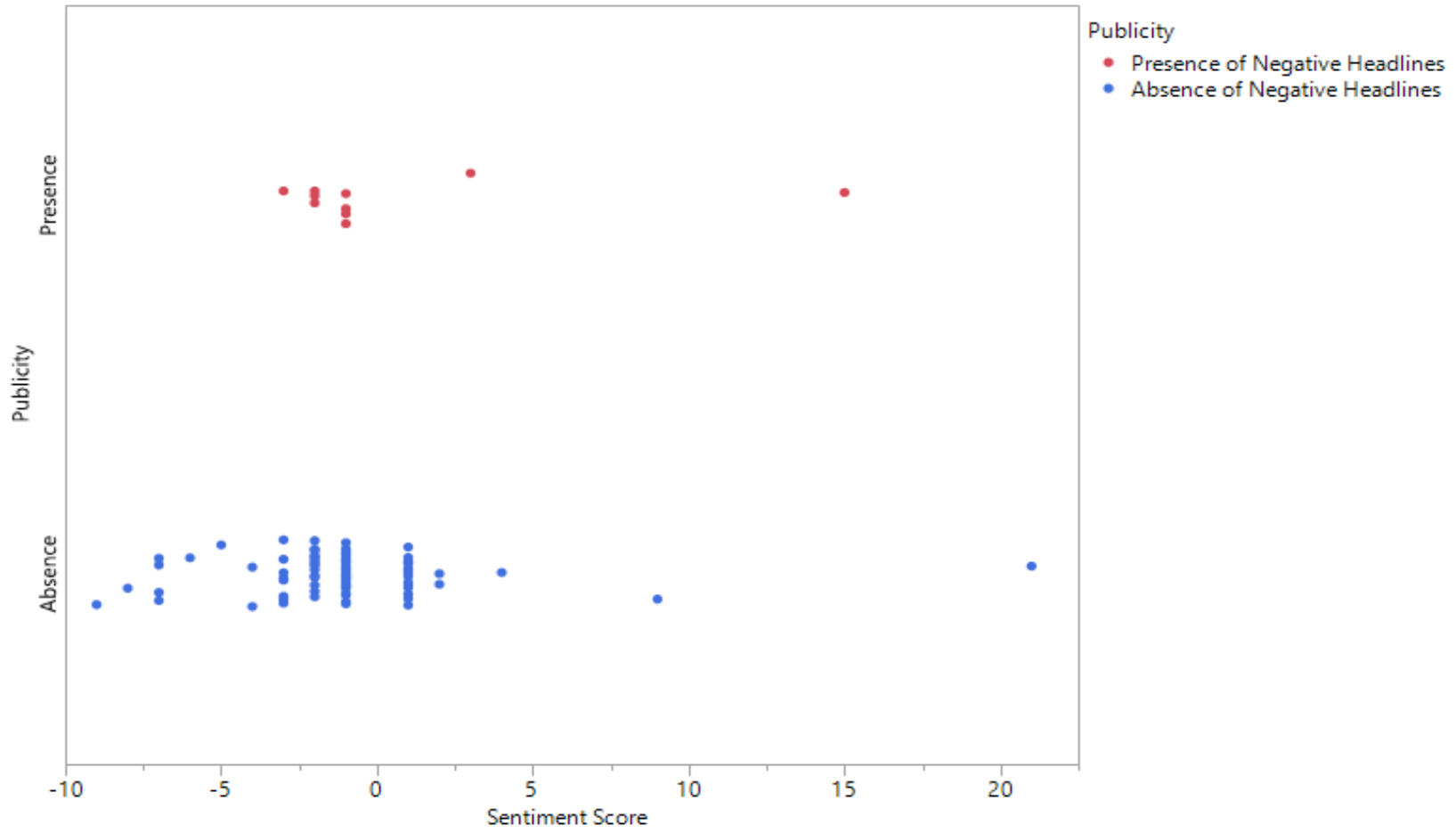
RO2: Factory distribution by sentiment score



Sentiment Score = Number of Non-negative feedback (represented by positive number)

+

Number of Negative feedback (represented by negative number)

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Factories with Negative Publicity

Title	Factory Name	Date of Event	Trigger of Event	Outcome
Ashulia apparel factories resume work after five days	a190, a69	26-Dec	layoff, low wage	protest
Bangladesh Accord cuts ties with four more factories	a9	24-Feb	lack of fire safety	accord cut ties
Fire at knitwear factory in Gazipur, 2 hurt	a45	9-Dec	fire	2 injured
Fire at RMG factory in Ashulia	a116	19-Nov, Dec 25	Fire, low wage	no injury, strike
Fire panic leaves 50 RMG workers hurt in Gazipur	a36	12-Dec	fire	50 injured
Suspended by Accord (information gathered from accord website), Global Retailers Call for Action on Labor Issues in Bangladesh	a56	Aug-16, Jan 20,2017	lack of fire safety, Forced Overtime	accord cut ties
Suspended by Accord (information gathered from accord website)	a132	Oct-16	lack of fire safety	accord cut ties
Suspended by Accord (information gathered from accord website)	a150	Dec-16	lack of fire safety	accord cut ties
Inspection report from FLA	a102	Oct- 23	Violation in codes	
Rana Plaza tragedy marks 3rd anniversary	a11	April 23	demand for the mourning day for Rana plaza event	Protest on street
Bangladesh Canvas: AFWA levels allegations on Walmart's Bangladesh suppliers	a14	Aug 1	Report of illegal overtime by Asia Floor Wage Alliance (AFWA)	Wage and Overtime limit issues
Stories from Slate; Three-and-a-half years after a deadly collapse, Bangladesh's apparel factories have safer structures-and working conditions so oppressive they're killing people.	a27	Dec 15	Unsafe working condition, low wage	Workers view in a news article

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Factories with Negative Publicity

Title	Factory Name	Date of Event	Trigger of Event	Outcome
Global news roundup	a65	Nov 15	Lack of fire exit, low wages	
Bangladesh Accord cuts ties with Young International	a192	June 6	Lack of fire safety	Suspension from Accord
Remediations and suspensions for Bangladesh Alliance	a22	Jan 10, 2017	Remediation process completed	Considered as safe facility
Two more Bangladesh Alliance factories fully remediated	a30	June 14	Remediation process completed	Considered as safe facility
January 22, 2017: Gestion Credit Expert Sarl; News Media, Target of Trump's Declaration of War, Expresses Alarm	a26	Jan 23, 2017	Low wage	Worker view in a report
Labor unrest-hit Bangladesh factories reopen	a126	27-Dec	wage hike	strike
News Track: Bangladesh: Accord and Alliance show door to six more RMG factories	a142	Oct 13	suspended by accord	Accord cuts ties
Protests in Bangladesh Shake a Global Workshop for Apparel	a157	Jan 22, 2017	low wage	Strike
Global Retailers Call for Action on Labor Issues in Bangladesh	a163	20-Jan	workers suspension	strike
Ashulia apparel factories resume work after five days	a19	26-Dec	strike for pay hike	strike
Ashulia apparel factories resume work after five days	a23	26-Dec	strike for pay hike	strike
Ashulia apparel factories resume work after five days	a137	26-Dec	strike for pay hike	strike
Ashulia apparel factories resume work after five days	a174	26-Dec	strike for pay hike	strike
Ashulia RMG factories reopened	59 factories	26-Dec	Pay hike	strike

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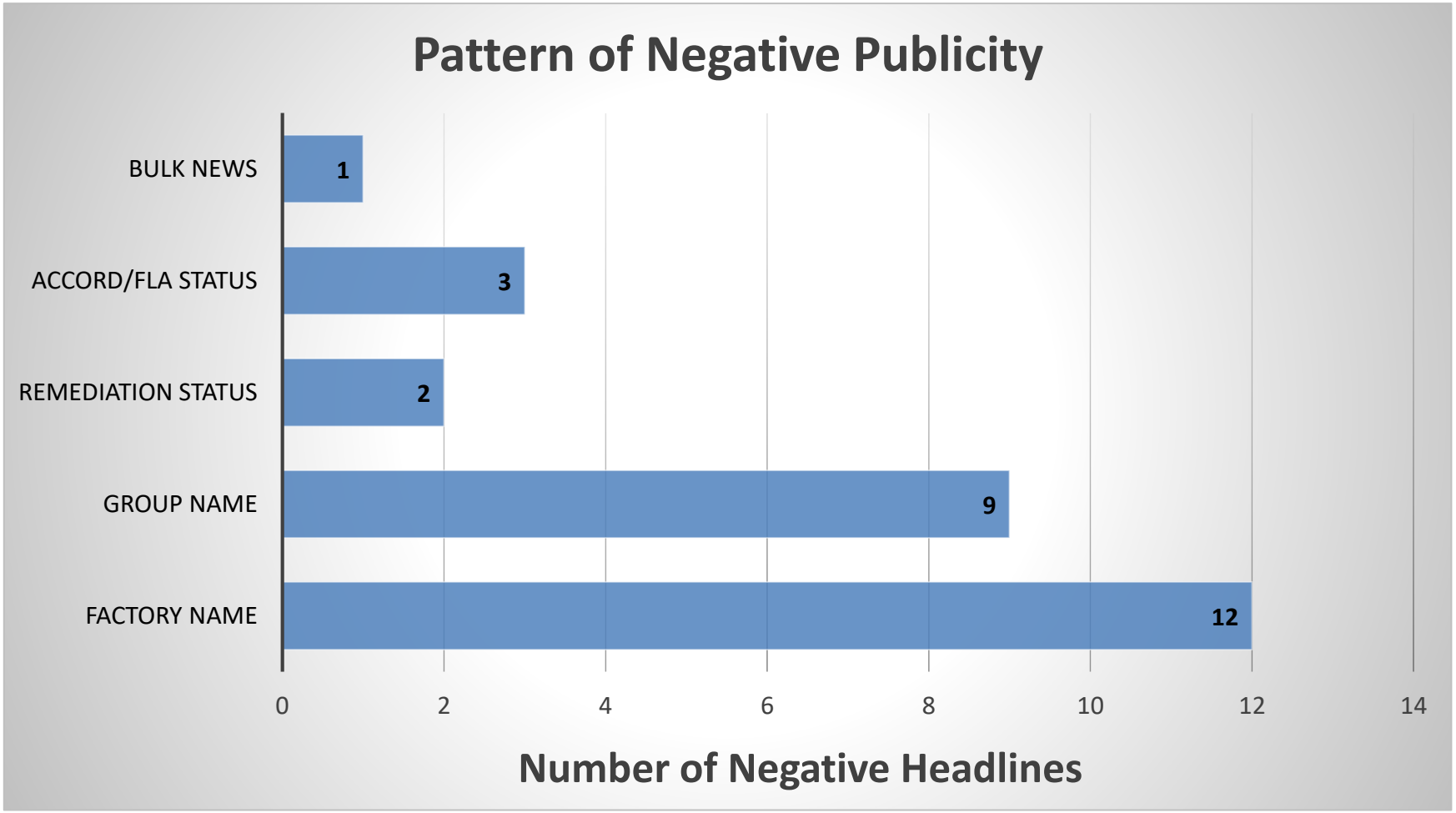
INISIGHTS FROM DATA SOURCE 3



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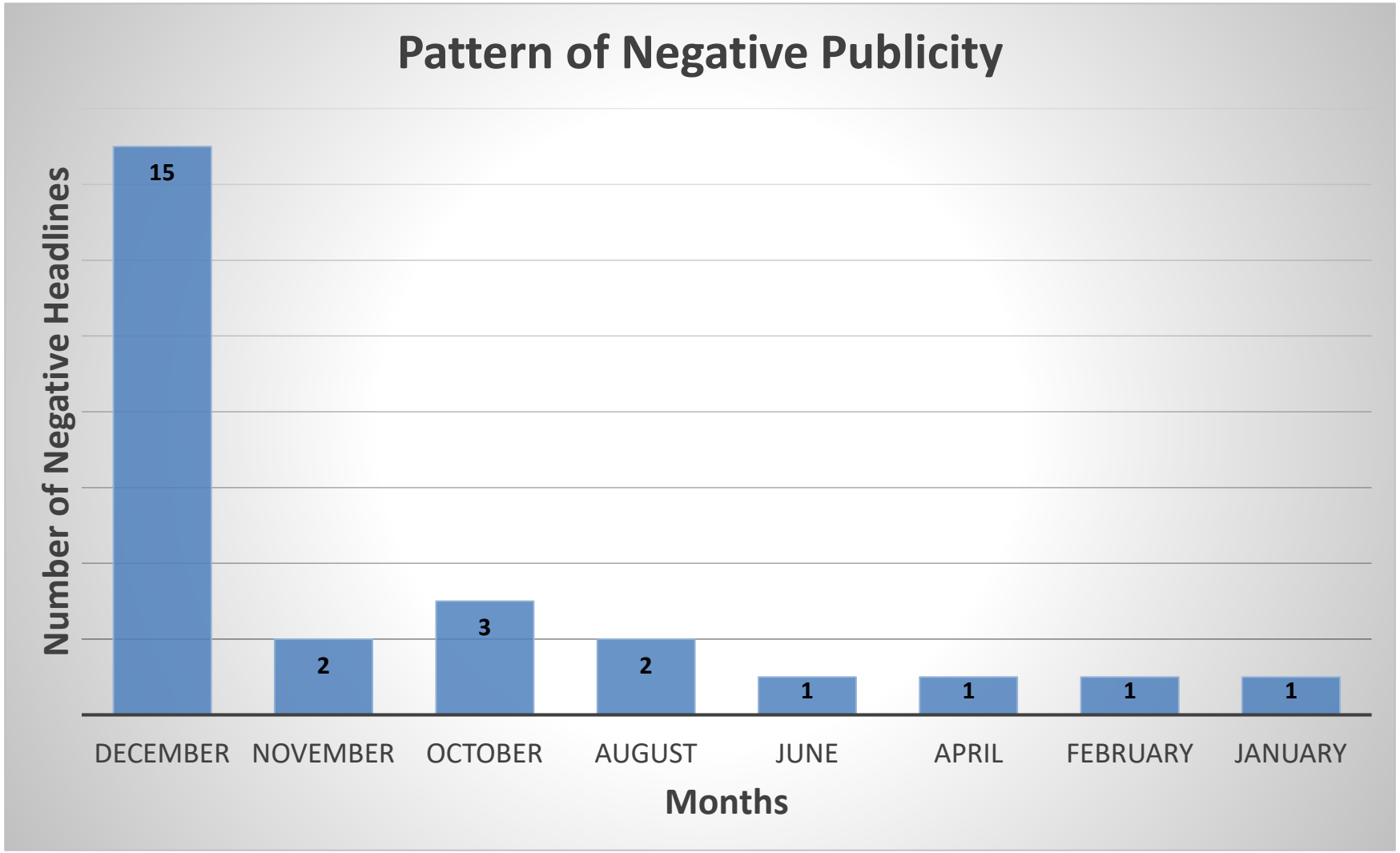
INISIGHTS FROM DATA SOURCE 3



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Outcome of RO1 VS RO2

RO1 outcome	RO2 outcome	Triggering factors of negative publicity in negative news articles
Forced Overtime, FOA, Long Working Hours	Delay in Wages, **Forced Overtime**, No complaints, Verbal Abuse, Physical Abuse, **FOA, Long Working Hours**, Clean Water accessibility, Child Labor, Sanitation of toilets, Inspection influenced by factory management.	Fire safety concerns, Low wages, **Forced overtime**, Pay hike, Layoff

Conclusion

Yes, we can use workers feedback crowdsourcing to protect apparel factories from reputational damage

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Implications

For Managers

- Additional data source
- Last 3 months focus

For Researchers

- More research arenas

For Labor Voices

- Relevant Issues
- Factory management influence
- Last 3 months focus
- External validation

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Limitation

- No generalization to manufacturing industry
- No country level indicator
- 194 out of 5,000 Bangladeshi apparel factories
- No inclusion of local Bengali newspaper
- No inclusion of brand names
- Same treatment to factories included in the group name

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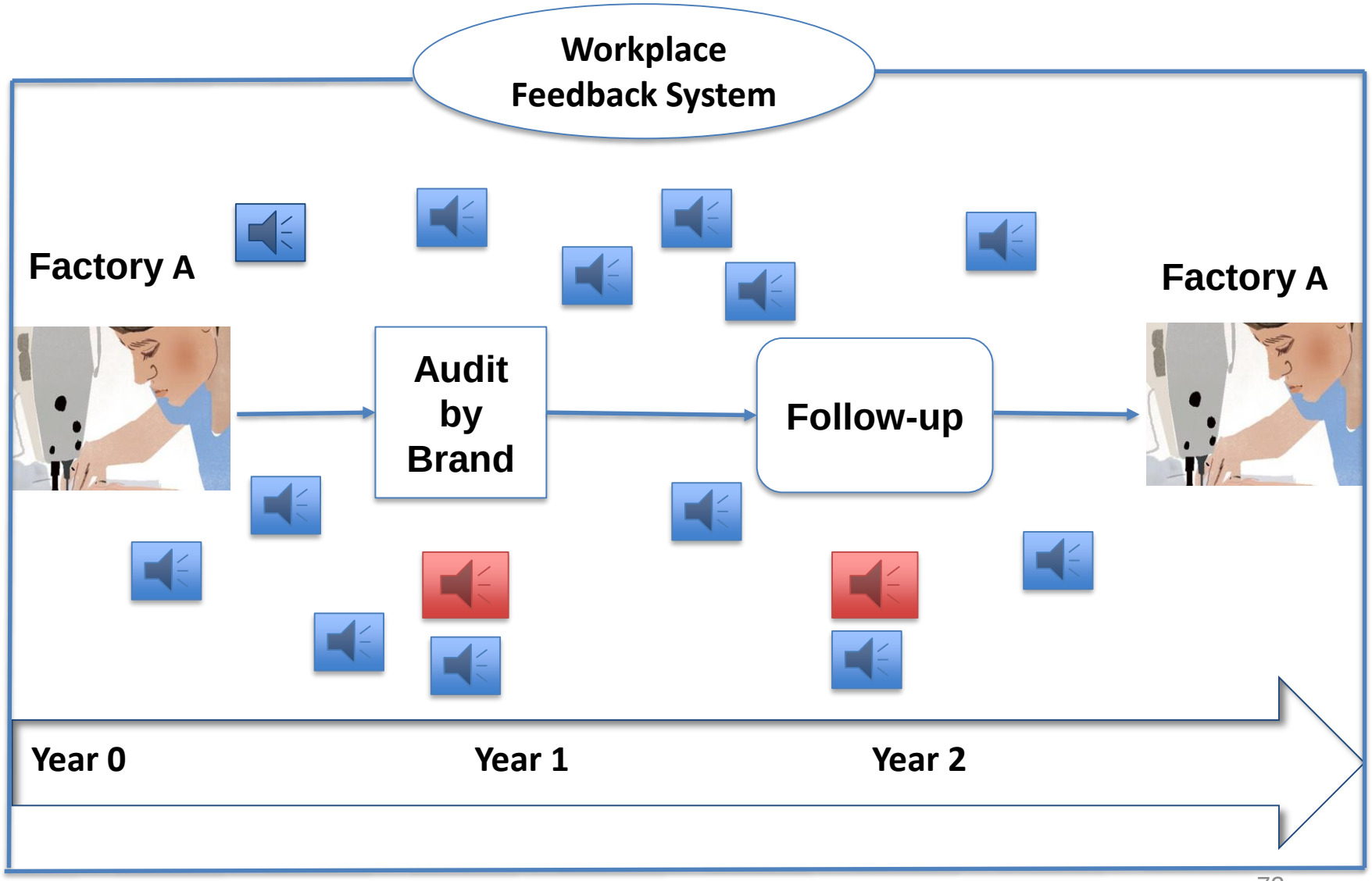
Future Research



For Questions contact at mhabbasi@ncsu.edu
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