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# On the Road Again – Using Rule-Oriented and Participative Leadership to Reduce Threats and Violence in the Construction Industry

RESEARCH NOTE

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## ABSTRACT

Threats and violence are acute safety issues in many industries and effect a large proportion of the Swedish workforce. In the construction industry, more than half of constructions workers redirecting traffic at construction sites are subjected to threats or violence at least once a year.

To help construction companies to systematically address and handle health and safety issues in accordance with the Provisions of the Swedish Work Environment Authority on Systematic Work Environment Management, an interventions method named Building Health has been developed by Gyllensten and colleagues. The intervention involved rule-oriented and participative leadership practise and was evaluated through a single case effect study in a middle-sized construction company.

The results showed significant reductions in the one-year prevalence of threats of violence (pre-intervention = 35.0%; post-intervention = 19.0%; $\chi^2$ = 7.047; p = .008), feelings of being threatened (pre-intervention = 42.7%; post-intervention = 23.8%; $\chi^2$ = 9.188; p = .002), and conflicts with third parties (pre-intervention = 48.5%; post-intervention = 30.6%; $\chi^2$ = 7.913; p = .005).

Combining rule-oriented and participative leadership when helping construction companies to improve their systematic work environment management for efficient handling of health and safety issues can have substantial positive effects on employees' work environment.



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## INTRODUCTION

Threats and violence have been identified as persistent safety issues in many industries (Barling et al., 2001; Hanson et al., 2015; Rogers & Kelloway, 1997), and approximately 10.5% of the Swedish workforce are annually subjected to threats of violence (Berthelsen et al., 2020). In the construction industry, the prevalence seem to be substantially higher (SEKO, 2019). According to a recent poll (SEKO, 2021), 53% of constructions workers redirecting traffic at construction sites are subjected to threats or violence at least once a year. Hence, it is urgent to develop evidence-based methods that can decrease the prevalence of threats and violence in the constructions industry and in other affected industries.

One way of addressing safety issues is through a combination of rule-oriented and participative leadership (Grill et al., 2017). In the constitution industry, the effects of rule-oriented and participative leadership on safety performance has been tested by Grill and colleagues (2017), and the results indicate that they are both positively related to core occupational safety indicators. Particularly, the results revealed an interaction effect between the two types of leadership, showing that by combining rule-oriented and participative leadership the effect on safety can be substantial (Grill et al., 2017). However, Grill and colleagues' (2017) study had a cross-sectional design and the results need to be corroborated in longitudinal research.

Furthermore, leadership research should not only address managers' individual and direct (i.e., relational) leadership. As described by Grill and Nielsen (2019), safety leadership in the construction industry also comprise indirect leadership, including integrating safety into underlying structures, such as tender materials, budgets, staff, contracts, reward systems, and time-tables. Leadership may be defined as the management of reinforcement contingencies in work settings and includes the process of facilitating individual and collective efforts to accomplish shared objectives (Podsakoff et al., 2006; Yukl, 2013). This understanding of leadership allows for leadership interventions to include multiple stakeholders, including managers, employees, and researchers, who's leadership during interventions may be crucial for intervention efficacy. Arnetz and colleagues (2017) violence prevention intervention with multiple stakeholders (i.e., researchers, managers, and employees) was found to have a substantial hampering effect on patient-to-worker violence in hospital settings, and a systematic review (Somani et al., 2021) in healthcare concluded that multicomponent interventions with multiple stakeholders, were most effective in handling workplace violence against nurses. Research is needed to assess if multiple stakeholder leadership interventions are effective for violence prevention in the construction industry.

### PARTICIPATIVE LEADERSHIP

Participative leadership is concerned with organizing decision-making processes so that the people affected by the decisions participates in the problem-solving and decision-making, and thereby ensuring that decisions, plans, and rules are based on the needs, competences and goals of the people affected by the decisions, plans and rules (Grill et al., 2017). Birgersdotter and colleagues' (2002) study on companies with well-functioning systematic work environment management indicate that the employees in these companies had been involved in the work environment management and that the development of the systematic work environment management had been adapted to the specific company. Similarly, the participative model for implementing systematic work environment management applied in Andersson and colleagues' (2006) study was found efficient for helping companies develop their systematic work environment management, implement specific work environment improvements, and increase commitment to systematic work environment management. Hence, participative leadership seem to be a critical ingredient for implementing efficient systematic work environment management. However, as shown by Grill and colleagues (2017), participative leadership should be combined with rule-oriented leadership to achieve its full potential.

### RULE-ORIENTED LEADERSHIP

Rule-oriented leadership in the construction industry is about establishing and enforcing rules, regulations, and plans (Grill et al., 2017; Grill & Nielsen, 2019). In Sweden, companies are obliged to incorporate rules and regulations for occupational health and safety (OHS) through systematic work environment management (AFS, 2001). The Swedish Work Environment Authority provide information, provisions, and guidelines for how construction companies can establish effective systematic work environment management (AFS, 1993, 1999, 2001, 2015; Frick, 2013; Frick & Johanson, 2013). Work environment management may be effectively systemized in constructions companies by helping them implement the rules and regulations the Swedish Work Environment Authority; that is, through rule-oriented leadership. In their provisions and guidelines, the Swedish Work Environment Authority emphasizes that companies need to make decisions about how the provisions and guidelines are to be implemented in their business; that is, adapting rules to the specific needs and possibilities of the company (AFS, 2001).

### THE BUILDING HEALTH METHOD

Based on the work by Birgersdotter and colleagues (2002) and Andersson and colleagues (2006), Gyllensten (2020) and colleagues have developed a new intervention method called Building Health, a workshop-based intervention in which construction companies are helped to develop

and systemise their work environment management. The method includes both rule-oriented and paricipative leadership. The present study aims to test if this method can improve construction workers' work environment by decreasing threats and violence.

## METHODS

This is a single case effect study in one middle-size construction company whose core business is redirecting traffic at construction sites. The effect of the intervention was assessed by sending out questionnaires to all employees in the company before and after the company's participation in a Building Health intervention. The pre-measurement was made in November 2020 and the post-measurement in November 2021.

### RESPONDENTS

At pre-intervention, 278 questionnaires were sent out and 107 responses were returned, corresponding to a response rate of 38%. The proportion of men was 75%, the average age was 41.5 years, and the average tenure was 1.9 years. At post-intervention, 215 questionnaires were sent out and 63 responses were returned, corresponding to a response rate of 29%. The proportion of men was 75%, the average age was 44 years, and the average tenure was 2.3 years.

### THE BUILDING HEALTH METHOD

The Building Health intervention (described in more detail in Gyllensten, 2020) took place over a period of eight months and consisted of one full-day workshop and five half-day workshops. Each company participated with a development team consisting of two managers and two employees. The companies were economically compensated for the time spent on the workshops and on implementing changes in their companies between workshops.

During the workshops, the researchers were process leaders, (i.e., led the process of facilitating individual and collective efforts to accomplish shared objectives). The companies were provided with information, tools, and support to systematically assess and handle a work environment issue of their own choice. The rule-oriented leadership component of the intervention consisted of enforcing the rules and regulations outlined in the Provisions of the Swedish Work Environment Authority on Systematic Work Environment Management (AFS, 2001), and assisting the participants in implementing functional structures for the systematic work environment management in their companies. The companies were helped to analyse, set goals, develop action plans, and make decisions for how to deal with their work environment issue. The participative leadership component of the intervention consisted of allowing each company to decide which work environment issue to address, which goals to set related to the issue, how to handle the issue, and how to systemize their work environment management.

During the time between workshops, the development team were process leaders (i.e., led the process of facilitating individual and collective efforts to accomplish shared objectives) vis-a-vis their company and implemented their action plans in the company. A researcher with expertise in the work environment issue of the company was available to help the company with the implementation. The researcher made a workplace visit after the first workshop, to assess the nature and magnitude of the work environment issue in the company. Thereafter, the researcher discussed the problem with the development team and was available to the company for consultation during the intervention period.

The company of this single case study participated in a Building Health intervention and set three goals for their work environment: 1) reduce the prevalence of threats and violence, 2) increase employees' ability to cope with threats and violence, and 3) increase employees' reporting of threats and violence. To reach these goals, the company implemented the following changes: it incorporated conflict-management training in its 1-day introduction program for new employees, it introduced weekly feedback on incidents-reports to its employees via the company's internal website, it increased the number of visits to the company's worksites by the company's OSH expert and the local safety representative, it organized three local systematic work environment management-teams each led by one human resource manager (two of whom were new recruits), it employed one additional OSH expert, and it planned for introducing body-cameras for all employees.

### MEASUREMENTS

#### Primary outcome variables: reduce the prevalence of threats and violence

The prevalence of *physical violence* was measured with one item from COPSOQ III (Berthelsen et al., 2020): "Have you been exposed to physical violence in your workplace during the last 12 months?" The prevalence of *threats of violence* was measured with one item from COPSOQ III (Berthelsen et al., 2020): "Have you been exposed to threats of violence at your workplace during the last 12 months?" *Feelings of being threatened* was measured with one item adapted from COPSOQ III (Berthelsen et al., 2020): "Have you felt threatened at work during the last 12 months?" The response options of all three items were: yes daily, yes weekly, yes monthly, yes a few times, and no.

The prevalence of *conflicts* was measured with an adaptation of one item from the Swedish Work Environment Authority's survey (Klevestedt, 2017): "Are you involved in any form of conflict or quarrel in your workplace with people who do not work at the workplace?" The response options were: every day, a couple of days a week, one day a week, a couple of days a month, a few times during the last 3 months, a few times during the last 12 months, never during the last 12 months.

### Secondary outcome variable: increase employees' coping ability

To measure the extent to which employees felt confident handling threats, five items from the Pearlin and Schooler's (1978) coping scale were adapted to measure *coping* with threatening situations at work: "When threatening situations arise at work…": 1) "…there is really no way I can solve the situation", 2) "…there is very little I can do to change the course of events", 3) "…I often feel helpless", 4) "…it feels like my fate is in the hands of others", and 5) "…I have little control over the things that happen to me". Each item was rated on a Likert scale ranging from 1 (not at all correct) to 6 (completely correct). Cronbach's alpha was 0.92 pre-intervention and 0.93 post-intervention.

### Tertiary outcome variables: increase employees' reporting behaviour

To measure *reporting threats*, the company developed the item: "Did you inform your immediate superior that you had been threatened?" In addition, the company wanted to increase positive reinforcement of reporting behaviours, and so they developed an item measuring how employees experienced reporting threats: "Did you get the support from the company you expected?" The response options of both items were: yes and no.

### Descriptive information on threats

To gain more detailed knowledge about the nature of the threats, the company also developed a set of descriptive items: "If you have been threatened…", "…what time of the day did the threat/s occur?", "…what gender had the person/s who threatened you?", "…what age was the person/s who threatened you?", "…what work task did you do when you were threatened?", "…was the person/s who threatened you a pedestrian, cyclist, motorist, truck driver, bus driver, taxi driver, customer, or other?", and "…did the threat/s occur when working alone or with colleagues?"

## DATA ANALYSIS

Before conducting the data analysis, all primary outcome variables were dichotomized into yes or no responses resulting in one-year prevalence variables of physical violence, threats of violence, feelings of being threatened, and conflicts (for physical violence, threats of violence, and feelings of being threatened, the responses yes daily, yes weekly, yes monthly, and yes a few times, were set to yes; for conflicts, every day, a couple of days a week, one day a week, a couple of days a month, a few times during the last 3 months, and a few times during the last 12 months, were set to yes). The changes in the primary and tertiary outcome variables were tested with non-parametric $\chi^2$-tests comparing post- with pre-intervention prevalence of yes and no responses. The change in the secondary outcome variable was tested with a parametric independent sample t-test.

# RESULTS

## PRIMARY OUTCOMES: PREVALENCE OF THREATS AND VIOLENCE

Table 1 shows the one-year prevalence of *physical violence, threats of violence, feelings of being threatened* and *conflicts* pre- and post-intervention, and the results of $\chi^2$-tests comparing post- with pre-intervention prevalence. The results show significant reductions in *threats of violence* (pre-intervention = 35.0%; post-intervention = 19.0%), *feelings of being threatened* (pre-intervention = 42.7%; post-intervention = 23.8%), and *conflicts* (pre-intervention = 48.5%; post-intervention = 30.6%). The reduction in *physical violence* (pre-intervention = 6.8%; post-intervention = 4.8%) was statistically non-significant.

## SECONDARY OUTCOME: EMPLOYEES' COPING ABILITY

Table 2 outlines the result of the change in ***coping*** with threats. The change was statistically non-significant.

## TERTIARY OUTCOME: EMPLOYEES' REPORTING BEHAVIOUR

Table 3 provide the results on *reporting threats* and *receiving support* from the company when reporting threats. Pre-intervention, 30.2% of the threats were reported and

| | PRE-INTERVENTION | | | | POST-INTERVENTION | | | | $\chi^2$-TEST | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | | NO | | YES | | NO | | $\chi^2$ | p |
| | *n* | % | *n* | % | *n* | % | *n* | % | | |
| Physical violence | 7 | 6.8 | 96 | 93.2 | 3 | 4.8 | 60 | 95.2 | 0.413 | .520 |
| Threats of violence | 36 | 35.0 | 67 | 65.0 | 12 | 19.0 | 51 | 81.0 | 7.047 | .008 |
| Feelings of being threatened | 44 | 42.7 | 59 | 57.3 | 15 | 23.8 | 48 | 76.2 | 9.188 | .002 |
| Conflicts | 49 | 48.5 | 52 | 51.5 | 19 | 30.6 | 43 | 69.4 | 7.913 | .005 |

**Table 1** One-year prevalence of physical violence, threats of violence, feelings of being threatened, and conflicts pre- and post-intervention, and the results of $\chi^2$-tests comparing post- to pre- intervention prevalence.

| | PRE-INTERVENTION (n = 90) | | POST-INTERVENTION (n = 59) | | INDEPENDENT SAMPLE T-TEST | | |
|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | MEAN DIFF. | t | p |
| Coping | 2.23 | 1.14 | 2.06 | 1.24 | -0.17 | 0.87 | .386 |

**Table 2** Mean values pre- and post-intervention, and the results of the independent sample t-test of the mean pre- and post-intervention.

| | PRE-INTERVENTION | | | | POST-INTERVENTION | | | | $\chi^2$-TEST | |
|---|---|---|---|---|---|---|---|---|---|---|
| | YES | | NO | | YES | | NO | | $\chi^2$ | p |
| | *n* | % | *n* | % | *n* | % | *n* | % | | |
| Reporting | 13 | 30.2 | 30 | 69.8 | 7 | 30.4 | 16 | 69.6 | 0.001 | .980 |
| Receiving support | 37 | 86.0 | 6 | 14.0 | 23 | 95.8 | 1 | 4.2 | 1.927 | .165 |

**Table 3** The proportion of employees who reported threats and received support when reporting threats pre- and post-intervention, and the results of the $\chi^2$-test comparing post- to pre- intervention prevalence.

86.0% of the employees got the support they expected. Post-intervention, 30.4% of the threats were reported and 95.8 % of the employees got the support they expected. The changes were statistically non-significant.

### DESCRIPTIVE RESULTS

Pre-intervention, the threats were evenly distributed over the day: 38% occurred daytime (09 – 16), 24% at night (20 – 05), 21% in the evening (16 – 20) and 18% in the morning (05 – 09). Eighty-four percent of the perpetrators were men and 16% women. Two percent of the perpetrators were younger than 18 years, 11% were 18 – 25 years, 20% were 25 – 30 years, 26% were 30 – 40 years, 33% were 40 – 65 years old, and 7% were older than 65 years. The employees were threatened as they were guarding traffic (58%), guarding gates (18%), guarding establishment (12%), driving Truck Mounted Attenuator (7%), or performing other tasks (5%). The threats occurred as frequently when working alone (50%) as when working with colleagues (50%). The perpetrators were car drivers (41%), pedestrians (16%), taxi drivers (13%), cyclists (11%), bus drivers (8%), truck drivers (5%), and others (6%).

Similarly, post-intervention, the threats were evenly distributed over the day: 34% occurred daytime (09 – 16), 26% at night (20 – 05), 19% in the evening (16 – 20) and 21% in the morning (05 – 09). Eight-five percent of the perpetrators were men and 15% women. Zero percent of the perpetrators were younger than 18 years, 17% were 18 – 25 years, 18% were 25 – 30 years, 31% were 30 – 40 years, 31% were 40 – 65 years old, and 4% were older than 65 years. The employees were threatened as they were guarding traffic (47%), guarding gates (15%), guarding establishment (15%), driving Truck Mounted Attenuator (17%), or performing other tasks (6%). The threats occurred as frequently when working alone (55%) as when working with colleagues (45%). The perpetrators were car drivers (43%), pedestrians (14%), truck drivers (12 %), taxi drivers (9%), cyclists (7%), bus drivers (4%), and others (11%).

## DISCUSSION

Threats and violence are acute safety issues in many industries and affects a large proportion of the Swedish workforce (Klevestedt, 2017; Berthelsen, 2020). In the construction industry, more than half of constructions workers redirecting traffic at construction sites are subjected to threats or violence at least once a year (SEKO, 2019, 2021). Construction companies are obliged to provide their employees with safe and healthy work environments and to maintain a systematic work environment management, which include addressing issues of threats and violence (AFS, 1993, 2001, 2015). To help construction companies to implement an efficient systematic work environment management that handles issues of threats and violence and other health and safety issues, an interventions method named Building Health has been developed by Gyllensten (2020) and colleagues. The method includes rule-oriented and participative leadership practise. The results of the study indicate that the method can have a substantial effect on employees' work environment by decreasing the occurrence of threats of violence, feelings of being threatened and conflicts with third parties. The intervention was designed so that each company chose a work environment issue to address and decided how to address it, as long as they organized their work in accordance with Swedish Work Environment Authority Provision for Systematic Work Environment Management (AFS, 2001). The changes implemented by the company in the study align with how safety is promoted at constructions sites by site managers through indirect safety leadership as described by Grill and Nielsen (2019; i.e., establishing underlying structures that support safety) and by OSH coordinators through administrative and engineering controls as described by Ajslev and colleagues (2022).

It's notable that no statistically significant effect on coping was found. However, only one of the implemented

actions targeted this goal (i.e., conflict management training). Healthcare research on conflict-management training (Geoffrion et al., 2020) indicate that training may be effective. However, most such training interventions have a longer duration (Tölli et al., 2017).

The descriptive data on the nature of threats was stable between pre and post intervention, indicating high test-retest-reliability. It provides information on when employees are subjected to threats and who the perpetrators are, information that can be used to handle threats with a higher level of precision.

## LIMITATIONS

The study was a case study in one single company with a limited number of employees. Hence, it is unknown if the results can be generalized to other companies in the constructions industry or other industries suffering from high prevalence of threats and violence. Also, the study included no control-group. Therefore, it can't be determined whether the effects were due to the intervention or due to some other internal or external circumstance. For example, it is possible that the company would have implemented the same changes even if it hadn't participated in the intervention.

Pre-intervention data was collected in November 2020 and the respondents were then asked to rate their exposure to the outcome variables during the last 12 months, a period that extends back to the beginning of the Covid-19-pandemic. It is possible that the prevalence of violence, threats and conflicts was higher before social distancing was implemented as a national strategy for Covid-19 mitigation. However, the Covid-19-pandemic and social distancing was in effect already during most of the 12 months leading up to November 2020.

Economically compensating companies for spending time on systematic work environment management is not always feasible. However, as described by Grill and Nielsen (2019), indirect safety leadership can be used to integrate demands on companies' systematic work environment, including staffing and budgeting, into the procurement procedure and tender materials.

Finally, the relatively low response rate, especially on the follow-up questionnaire, implies that it is unknown to what extent the respondents were representative of the company's employees or of construction workers at large.

## CONCLUSION

Combining rule-oriented and participative leadership when helping construction companies to improve their systematic work environment management, can have substantial positive effects on employees' work environment in terms of reductions in threats of violence, feelings of being threatened and conflicts with third parties. By using workshop-based interventions to help companies implement the rules and regulations provided by the work environment authorities in a way that aligns with the goals and needs of the company, companies may develop action plans and realise changes that successfully handle urgent work environment issues in a systematic way. Fellow researchers are encouraged to replicate the study in larger samples and with more stringent research designs (e.g., randomized controlled trials), to assess if the effects are indeed related to the intervention, and to determine the generalizability of the results.

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## COMPETING INTERESTS

The author has no competing interests to declare.

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