

The case for behaviour based safety in the construction industry



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Construction continues to have the largest number of fatal and major injuries among UK industry groups and the general rates have shown only a small amount of change over the last number of years. Safety processes can (and do) fail, resulting in injuries and incidents. Behavioural science uses data and analysis to come to conclusions about what is actually happening. Therefore, objectivity is at the core of behavioural science. This science of behaviour can help us produce more effective implementations of safety solutions. BBS processes most typically involve careful observation of behaviour, feedback, and reinforcement designed to change behaviour in strategic ways. BBS processes recognize the workplace environment as the dominant factor in the creation of safe working. This focus on behaviour needs to be co-ordinated with the elimination of work hazards. Our basic premise is that workplace injuries are reduced when we understand their causes. This paper will discuss the history, successes, and failures of BBS, and suggest fertile areas for improving traditional safety practices.

Overview

This is an attempt to say some things you may find logical, obvious and yet still interesting. Our basic premise is that workplace injuries are reduced when we understand their causes. Their causes are often related to the behaviour of executives, managers, supervisors, and

employees (each in different ways). If we use science to understand what causes behaviour (i.e., behavioural science, for examples, see Daniels & Daniels, 2004; McSween, 2003), then we've got a fair chance of reliably changing it, and avoiding disaster.

Companies may well have voluminous rules and regulations designed to achieve various objectives; on their own these rules will not drive behaviour. It is irresponsible to think that just creating and publishing a set of rules will deliver various human behaviours. It is the employer's responsibility to make sure the workplace environment is safe. Safety law is not complex, it's simple, many employers make this simple goal extremely complex and in doing so create unsafe places for people to work.

For very understandable and logical reasons companies, organisations, and projects feel that they need to cover themselves against prosecution for not obeying the law of the land. This concern is translated into processes, governance and compliance in the form of written documents, training, auditing and coaching.

Behavioural science suggests that humans only have so much capacity to take things in; when you have reached saturation point there is no benefit in continuing. Many safety processes over-whelm even the most diligent of engineers and construction workers. Many processes are badly written, not written in a form suitable for the reader and do not take into account the likelihood of them ever being read at all (Larkin & Larkin, 2007). Understanding behavioural science helps us to realise the errors in our typical communication strategies, so we can change them and produce different results. This article aims to explain some simple ways of applying behavioural science to safety management.



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Safety statistics, the story so far

Construction continues to have the largest number of fatal and major injuries among UK industry groups. The rate of fatalities has shown a general decreasing trend over the past 10 or more years, with a 34% decrease over the past 3 years (2006/07 – 2008/09) from 3.8 to 2.5 per 100,000 workers. Major injuries have shown a gradual decreasing trend as well, decreasing only 15% over the past 3 years (300.7 – 254.1 per 100,000 employees). However, there is data to suggest that under-reporting of major injuries is a significant factor in construction (as well as in other industries). The Labour Force Survey (LFS) estimates that only about 1/3 of all major injuries are reported under RIDDOR (Health and Safety Executive 1991 as cited in Levitas & Guy, 1996).

Injury and ill-health in the construction industry account for an estimated 3 million lost days per year, which is equivalent to an average of 1.4 days per worker (Health and Safety Executive, 2009a). According to the Health and Safety Executive (2009b), in construction a higher proportion of injuries were caused by falls from height, falling objects, contact with moving machinery, collapses/overtums, and electricity.

Given the complexity of most construction projects, managing safety is a real challenge. To this end, there are myriad laws and regulations when managing any construction project, all designed to save lives, avoid injury and improve the general well-being of employees on those projects.

In our view, the principle challenge is not how to write better procedures, laws, and codes (although clearly, these are important aspects of managing safety); but rather it is how to motivate everyone associated with a project site (i.e., executives, managers, foremen, and employees) to follow the known procedures as they should.

The case for behaviour based safety

One of the leading science-based approaches to creating this sort of behaviour change is called behaviour-based safety (BBS). Behaviour-based safety (BBS) has been practiced in organizations for more than 30 years.

The initial scientific studies demonstrating the efficacy of the behavioural approach were published in 1978 in the United States (Komaki, Barwick, & Scott, 1978; Sulzer-Azaroff, 1978). These studies, and many others, clearly showed that the use of some rather simple and straightforward behavioural science techniques could quite dramatically and very rapidly improve safety behaviour (and consequently, injuries) on the job. Since the 1970's BBS has been successfully applied around the world in a multitude of countries, cultures, and languages. BBS applications, when correctly implemented, show an average of 20-25% year-over-year reductions in injuries and related costs (Krause, Seymour, & Sloat, 1999).

The most common sequence of steps to apply BBS involves (Sulzer- Azaroff & Austin, 2000):

- 1) Determining the controllable factors involved in injuries (e.g., processes, environmental conditions, worker and manager behaviour).
- 2) Defining these behaviours, processes, and conditions precisely enough to measure them.
- 3) Implementing procedures to reliably measure the behaviours, processes, and conditions to determine their current status and setting reasonable goals for their improvement.
- 4) Providing feedback.
- 5) Reinforcing progress.

Most modern BBS applications also include a component in which the organization's members develop ways to continuously improve these processes of identification/correction and reinforcement.

Some Lessons Learned – Successes and Failures of BBS

Despite the fact that there have been a multitude of successful applications of BBS around the world in most industries, there are those who criticise the approach and there are some potential pitfalls when implementing the process. Below, we discuss just a few of these potential pitfalls.

1. Blame the worker.

Some of the large labour unions have gone to great lengths to point out what they see as shortcomings in the BBS process. To be sure, we see these things as landmines to avoid in implementations, but they are not foregone results of every BBS implementation. A primary criticism often levelled by the United Auto Workers (UAW, Howe, 2001) and other labour unions is that BBS results in a “blame the worker” mentality. The suggestion is that BBS allows management to shirk its responsibilities to provide a safe work environment through the use of engineering controls. Instead, the argument goes, employees are given the task of implementing safety processes that are not properly resourced. We believe this is important to avoid, primarily by involving leaders at all levels of the organization in the process, to ensure that everyone is doing what they can to create safe work and safe working environments.

2. Safety incentives.

Another potential pitfall is the use of safety incentive systems. Incentives do work, and there are many research studies to back this claim up. However, it is very common to apply them in ways that result in under-reporting of injuries and other related problems.

For example, while working with a large corporation that had team-based quarterly cash incentives for avoiding injuries, one of us learned of a recordable injury that was covered up by a team of employees. An employee broke his leg during the last day of the quarter, and because going to the hospital would have meant that his team lost its bonus, at the urging of his team mates he worked light duty for the rest of the day and went to the hospital the next day to be treated.

This and other potentially detrimental practices appear to be based in behavioural science theory,

but on closer inspection they are merely the misguided attempts of those who have not taken the time to learn behavioural science.

3. Safety observations.

Many organizations implementing BBS become obsessed with collecting employee safety observations so much that they develop reward systems to promote data collection. One such system we witnessed was ill-designed: for every observation employees conducted and submitted, they earned the chance to win a car! The result was that there was a huge increase in the number of observation sheets completed, but that most of them were completed at the desk of the employee (i.e., faked, or “pencil whipped”). In behavioural science, there’s an old adage that says, “Be careful what you reinforce!”

In this case, the behaviour that was reinforced was turning in completed observation sheets – quality was not considered in arranging the system, and therefore quality was not part of employees’ responses.

BBS applications

Since its inception the focus of BBS application has evolved, and has progressed through at least 3 distinct phases:

1. Supervisor-driven applications
2. Employee-driven applications
3. Leadership-focused applications

A good deal has been written about the first two phases, but little has been written about the third. In this paper, we will define these phases and give examples of each, ending with a more detailed discussion, based upon our experience in applying these concepts, of what leaders can do to support safety processes, especially in the area of construction safety.



Supervisor-driven applications

Early applications of BBS were what we would call “Supervisor-driven” because observations, feedback, and reinforcement were placed in the hands of supervisors. Employees, doing “the work” of the organization, were the recipients of the safety programme, and front-line supervisors and safety personnel typically delivered the programmes.

Mid-level managers and executives were largely left out of the picture, and employees were expected to respond to the feedback delivered by the supervisors. One negative side-effect of this approach is that significant amounts of information is left on the table when one does not consult with, involve, and partner with those who “do the work” of the business. That is, employees usually know far more than anyone else about the shortcuts they are encouraged to take, and why they are encouraged to take them.

Most of the early research demonstrates this approach to applying behavioural safety where supervisors or safety personnel conducted behavioural safety observations and gave feedback to employees, who were then expected to correct their behaviour and the related conditions. The research applications of the supervisor-driven method worked very well, but in practice people began to notice the lack of involvement of employees, and realized that not involving employees was a critical mistake.

Employee-driven applications

As a result, we began more and more to see applications that were called “employee-driven.” The idea was to give employee teams all of the resources and support they needed to develop and “own” the safety process so that it worked for them. This worked in many respects, as having a significant say in how safety was to be managed and helped to build ownership and commitment to the safety process on behalf of employees.

Most of the books describing how to apply BBS fall into the employee driven category (i.e., Krause, 1995; McSween, 2003). However, this approach too has its drawbacks. Employee-driven applications do not tend to recognize the role of managers, executives, and other leaders in creating the environments— in our view, these processes suggest that we measure the behaviour of

“the victims” of environments (i.e., employee behaviour alone), not the behaviour of “the creators” of the environments (i.e., the behaviours of leaders in the organization).

Leadership-focused applications

The most effective applications of BBS seem to follow more of a leadership-driven model, in which leaders at all levels of the organization, who touch the safety process in any way, are identified and involved in the process of development and execution of safety performance. In this case, because they each are expected to engage in some unique behaviours to contribute to the safety process, people working at each different level of the organization enact quite different, but overlapping, safety management systems.

For example, executives impact safety through the strategic focus of safety and non-safety (i.e., production) operations; through arranging and communicating policy; and through providing resources for others to execute deliverables that are consistent with the strategic focus of the organization. Middle managers are often tasked with getting the results that are set out by executives. Supervisors are tasked with directly managing the workforce, and the workforce does the work.

Each of these levels impacts safety in its own ways and without careful analysis and testing of these impacts, one would never arrive at the optimal behaviours in which people at each level should engage. A principle drawback to this approach is that it can get overwhelming and cumbersome very quickly.



The leader is the key to success.

Some leaders say things like “I am 100% behind our safety programme”, “safety in this company is our number 1 priority”. Unfortunately in some cases what they really mean is that they think BBS is a good idea but they do not know what they should be seen to be doing which would confirm that they are indeed supporting the safety programme.

The benefit of using behavioural science as the vehicle to improve safety is that if the Company executives are willing to be measured on their behaviour then improvements can be achieved. Surveys, especially anonymous surveys are the first step in a ‘leadership led’ BBS programme.

By carrying out anonymous surveys the leadership can come to terms with the real safety concerns in their company. These concerns always look completely different to the customary ways of reporting on safety. In the typical construction company some or all of the following can be in place:-

- Voluminous lagging measures.
- Unusual scoring systems, which put the local manager at threat.
- Scores from audits of paperwork rather than behaviour.
- Unhelpful reactions to incidents and injury.
- Senior managers exhibiting the wrong behaviour when they visit sites.
- Some Companies’ unsophisticated base culture is not compatible with BBS.

Having successfully rolled out BBS programmes they work very well when the following conditions exist:

What do good leadership behaviours look like?

- A mix of leading and trailing measures.
- Lean safety processes tied to the BBS programme.
- Audit scores on behaviour as well as processes.
- Adult (calm, rational) responses when injury or incidents occur.
- Senior managers who know how to behave when on site.
- An enlightened (positive environment, not scary!) base Company culture exists.

Most people can relate to worker behaviours quite easily, the worker is or isn’t behaving in a safe manner; we can all observe it and agree. It’s more difficult to deal with the safe or unsafe behaviour of leaders (that is, everyone else involved in the project).

As an example, a Project Manager recently completed a course in BBS; the final action was to introduce a safety improvement for his site. He did not ask anyone on his site what they thought would be useful, nor did he analyse the safety data on the site. He did not consult his safety staff. He just decided that they would bring in mandatory eye wear.

He launched his initiative, met the workforce, bought everyone a breakfast, issued the eye wear and asked for records to be kept of workers complying with the new initiative. The first few weeks went well, the foreman reported to the agent that there was compliance and he reported back to the PM. The site didn’t receive any returning feedback from the PM over time and the initiative faded.

Construction (and perhaps every industry) is littered with examples of senior managers having ideas, with the best intentions to improve safety, production, morale, etc. Impatience, or perhaps other factors, sometimes cause the ‘consultation’ phase to be by-passed, resulting in an ‘imposed solution’ (the most unlikely solution to work from a behavioural perspective). From this standpoint, leaders must identify their critical behaviours (such as giving timely feedback on initiatives) and improve them. However, it is often tricky to identify the critical behaviours that should be managed.

This list (Lees, 2009a; 2009b) has been put together to help leaders decide what they can observe in themselves and others which may help them pinpoint and measure, feedback and improve behaviour. The list is based both on concepts taken from the science of human behaviour, and on our experiences in applying BBS widely over the last 15 years.

continued

Observable Leader Behaviours

- Always ask "Can you show me how this will impact safety."
- Making yourself too busy is destructive, it gives the impression you are not in control. It's very important to put open time in your diary which will be taken up by the inevitable urgent demands on your time, measure how much open time needs to be there.
- Well-run companies run on confidence; don't do anything which gives the impression of panic.
- High levels of safety performance come from well-planned jobs which are competently staffed, it is the leaders' job to create an environment where good planning occurs and where good people are hired and developed.
- Leaders should check that their staff are competent, they should do this with objective measures. The best way is to solicit anonymous feedback from teams and clients.
- Coaching (face-to-face or by phone) is the most effective way of engaging people. Email is the least effective way of engaging people.
- The route to improved safety on sites is concentrated at the foreman level, competent foremen are the key, leaders need to create environments which hire and train competent foremen.
- Foremen should understand behaviour change, pin-pointing and feedback, make sure your foremen can deliver effective briefings.
- Bid managers and some other senior managers will be under so much pressure to win jobs where safety will suffer, leaders must set up the environment where this is minimised.
- Lump sum jobs should have the same monetary value on safety as cost reimbursable ones, leaders can ask if this is the case and ask for evidence.
- Leaders need to be reliable, reply to e-mails, phone calls, turn up on time, complete actions, finish on time, this will engender trust and others will see this and copy it. Leaders are role models.
- Safety issues need to be challenged, always, do not allow people to use the law as an excuse for a complicated process; they simply didn't make enough time to write a simple process.
- Traditional audits measure results on sites at the time of audit, auditing behaviours will lead to more useful measures which can in turn effect safety improvements.
- Self-auditing is possible, with imagination more of this can be used, leaders should make this point, it says "I trust you".
- Leaders should help safety professionals find a useful positive role in the business, setting improvement goals for them will change their direction.
- Leaders should control the threat of something new in the workplace environment, or people's energy will be concentrated on undermining it. Align consequences for your new initiative and the behaviours that support it.

- Leaders should learn what natural reinforcers exist in their company environment, it may be depressing but a better view of the reality of the company will inevitably lead to better business (and safety) decisions.
- Leaders should solicit feedback and publish measurements on their own critical behaviours. They need to demonstrate that they are serious about this and also experience for themselves what they are asking others to do.
- Safety advisors should help leaders with surveys, climate surveys, anonymous (radio frequency) digital response card surveys, paper surveys, web-based surveys, and digital pen surveys.
- Safety advisors should be analysing the data from surveys and making compelling cases for what the data shows.
- Leaders should make their praise contingent on something they observed, make it specific and it will be very powerful. Platitudes do nothing but irritate others.

Conclusion

In summary, those leading projects in the construction industry should consider learning more about the science of behaviour. In our view, this science is a necessary addition to the toolbox of any leader or manager, especially in the area of safety. Applications of behavioural science show an average of 20-25% year-over-year reductions in injuries, across industries (Krause, Seymour, & Sloat, 1999).

BBS applications have tended to evolve through three phases: supervisor driven applications, employee-driven applications, and leadership-focused applications. We are partial to the last version, since it identifies critical safety-related behaviours at all levels of the organization rather than just holding accountable the people who do not have the resources to fully execute a complete system of safety. Leadership is one of the critical dimensions of creating well-functioning safety systems, and if leaders learn behavioural science their efforts will be much improved. In this paper, we tried to give some simple but important behaviour-focused tips that leaders can readily test in their safety efforts.

An awareness of behavioural science will help everyone understand and even be able to predict human behaviour, not learning this science is irresponsible if you are leading construction activities. Many behavioural safety applications are not as effective as they could be because of corporate cultural factors. This makes it doubly important that behavioural science is appreciated by all in the complex supply chain that is the construction industry.

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