

THE VISION OF ZERO RISK TOLERANCE IN CRAFT WORKERS AND OPERATIVES: AN UNATTAINABLE GOAL?

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Taking health and safety risks is no longer tolerated on construction sites. Behavioural based safety model programmes often seek to change risk-taking behaviours and eliminate accidents. Risk is a cultural construct. Site work can be seen as inherently risky. Construction operatives take many risks that non-construction workers would not want to take; for example working on high scaffolds or roofs, climbing tower cranes, working below ground. This is in part why some people work in construction; they like taking those risks. Safety programmes impose a risk limit of zero on people. This would seem to be in conflict with an argument that some workers need to have, by the very nature of their work, a higher risk tolerance than most. Programmes often fail to manage personal risk-taking and therefore accidents still occur. A literature review was undertaken, drawing from authoritative sources in construction and psychology. Six qualitative interviews were undertaken with craft workers / operatives who had either been disciplined for risk-taking on sites or who admitted to taking risks in their work. Condensed into vignettes, a narrative describes the actions and feelings of these workers. A high tolerance for risk was found, and given the nature of the work, this may indeed be necessary. There was no desire for reckless behaviour. The traditional industry drivers of production and speed are thought to be influential. High risk tolerance amongst workers may indicate that a vision of zero accidents may be unrealistic. To reduce levels of risk tolerance may be very difficult. More work is required to investigate how behavioural based programmes can be modified to take account of this aspect of construction site culture.

Keywords: craft worker, culture, health, risk, safety.

INTRODUCTION

Everyone takes some risks with their safety every day, be it driving a little too fast or crossing the road in too small a gap. In construction those risks are slightly different. Despite happily taking these everyday risks, most people would not want to climb a tower crane, or walk on a scaffold 25 stories high, or crawl a cradle up the side of a building hoping the wind does not change. But someone has to do it to get the job done.

So who works in construction? Even at an industry level, construction could be considered a risky operation. Financial risks are taken in terms of developments, every tender is a risk in terms of the time and budget requirements, not to mention risks arising during the construction phase (Langford *et al.* 2000; Flanagan and

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Norman 1993). At the grass roots level on sites, risk taking can have more serious human consequences. In the UK, risk taking acts and behaviours are estimated to account for up to 80% of site accidents (Wilson 2007; IOSH 2006). Risk taking forms one of the biggest problems in the industry in terms of health and safety on sites.

It is therefore arguable that from directors to steelfixers, a risk tolerant culture permeates throughout the industry. Everyone takes risks, albeit of a differing nature, and arguably that is, in part, what attracts people to the work. In an industry seen as macho and dangerous, studies have shown that many of the people attracted to work in construction show these characteristics in a much greater proportion than those who work, say, selling cars (Whitfield 1994). The construction workforce likes taking risks (Pidgeon *et al.* 1992): it likes climbing higher and tunnelling deeper than most people would ever feel comfortable with.

LITERATURE REVIEW

Risk and behaviour : the human factors

Risk is defined by the dictionary as ‘the possibility of incurring misfortune or loss’ (Collins 2000). A hazard can be defined as the potential for an unplanned event to occur which might cause harm (Clarke 1999), however as this paper is not concerned with hazards, risk will be used as a synonym for hazard, as the potential for unplanned events to occur is always present, as a risk that may or may not be taken.

The original concept of risk emerged from mathematical development of probability theory in gambling (Douglas 1992). In taking a risk a gamble is made on the likelihood of the misfortune or loss occurring versus the benefits of taking that risk (Cooper and Cotton 2000). And people do willingly take risks, gamblers may not like loosing but they do like gambling (Adams 2006). People in general have a tendency towards dangerous and risk-taking behaviours (Langford *et al.* 2000); skiing and hang-gliding are not considered out of the ordinary.

Studies by Tulloch and Lupton (2003) into perceptions of risk in the UK and Australia revealed that people do see positive aspects to taking risks. Through in-depth interviews with different social groups, three main benefits were found to be commonly perceived, especially with reference to taking voluntary risks. People felt taking risks allowed for self-improvement, it enhanced emotional engagement, allowing the self to extend beyond accepted boundaries of behaviour, and it allowed for self-control, both emotional and physical, to be tested and challenged. The study concluded that risk-taking was key to the development of the self, and taking risks was exciting, challenging, and seen as important in life. Other researchers have found risk-taking behaviour to be a confirmation of moral autonomy and independent choice (Adams 2006), which in a world where so much is managed, can prove very attractive.

It has also been found that people see familiar or voluntary risks as less serious than risks that are new or imposed upon them (Tulloch and Lupton 2003), and the ‘danger’ rating placed on such voluntary risks is often lower than for any involuntary risks (Starr 1969).

However, people are all individuals and will act differently in a given set of circumstances (Pidgeon *et al.* 1992). An individual cannot be predicted to take the same risk every time it is presented. Circumstances have a strong influence on risk-taking behaviour (Ajzen 2005).

Such behavioural inconsistencies form just part of the human social construct that has an effect on risk-taking. In addition to this, other human physiological tendencies will also exercise an influence, such as the optimistic bias, the predisposition to expect that things will turn out well, the overconfidence barrier, which places greater confidence in personal judgement than is justified, and the planning fallacy, the tendency to make optimistic predictions about how long a task will take (Baron *et al.* 2006), all of which can cloud judgement and consequently lead to risk-taking behaviours.

In addition to the above physiological aspects, there are also other drivers behind risk-taking, most notably the environment in which the behaviours occur.

Risk and behaviour: the construction industry

Risk is a cultural construct (Adams 2006) and therefore the construction site culture itself will also shape individuals' attitude towards risk. As behaviour itself is not culture, but merely a manifestation of it (Fellows 2008), the risk-taking behaviours found on site could be evidence of a risk tolerant culture lying beneath.

To analyse the perception of risk and risk-taking behaviours without acknowledging the cultural context would be incomplete (Renn 1992). The culture of an environment and its social processes and norms, such as those uniquely found in construction, provide an important frame of reference for the examination of risk-taking with regard to health and safety on sites (Lash 2000; Tulloch and Lupton 2003).

The two driving forces running through construction projects are time and money. For operatives paid on price or measure, working quickly is a necessity, but speed often means cutting corners and taking risks (Spanswick 2007). Production is also critical, not least for those working on price, as site supervisors often turn a blind eye to risk-taking if necessary production is achieved (HSE 2003). Indeed, it has been found that if taking a risk has positive consequences such as getting the job done more quickly then this act is likely to continue (Saari 1994). It has also been established that operatives are often prepared to take risks simply to get the job done, for money, for production, or just to keep their employment secure (Choudhry and Fang 2008; Cipolla *et al.* 2006; HSE 2003; Langford *et al.* 2000).

Characteristics of construction site culture will also influence risk-taking behaviours. Risk-taking can form part of the individual's construction of the masculine self (Lupton 2003), and in an industry that is 99% male this will inevitably have some influence (EOC 2006; McKay and Forster 2005). That men also define self largely through their work (Cockburn 1991) also intimates that these risk-taking behaviours are more likely to be carried out in this setting, and a construction site certainly provides the opportunity for this. In confirming an individual's independent choice, risk-taking will also appeal to construction operatives, who have been found to enjoy the high degree of autonomy that is part of the standard working arrangement (Applebaum 1981).

Construction operatives do take risks and this is highlighted by accident models specific to the industry. Two of the three root causes of accidents under the Accident Root Cause Tracing Model (ARCTM) (Abdelhamid and Everett 2000) are assigned to deliberate risk-taking on the part of operatives: either deciding to proceed with work activities once an existing unsafe condition has been identified, or deciding to act unsafely regardless of initial conditions of the work environment. Perception of risk is also critical, as the third root cause is that an unsafe condition was not identified,

however as previously discussed, this lack of identification may be due to an incorrect evaluation of the risk, coloured by a variety of influences.

Overall, construction operatives face a unique situation in terms of risk-taking behaviour. Not only are standard human physiological factors in play, but they are also influenced by the culture of the construction site. Indeed, the opportunity for risk-taking and facing danger could even have been one of the reasons operatives entered the industry originally. Taking a job in roofing, scaffolding or cladding could seem far more exciting than just sitting at a desk. Construction work undeniably requires a higher level of risk tolerance and risk-taking behaviour than the average occupation (Cooper and Cotton 2000). So why is this risk tolerance permitted, even encouraged, to a level needed to complete the work, and then a line drawn? - it may be the case that a limit is effectively placed upon this risk tolerance at a level dictated by legislation, safety programmes and construction site rules.

Reducing the risk

The Management of Health and Safety at Work Regulations (S.I. 1999 No. 3242) requires that risks associated with any work activity are assessed before work starts. These Risk Assessments (RAs) form the basis of all recent Health and Safety legislation and regulations (Read 2001). Indeed, since the Robbins Report of 1972, RAs have been standard management tools for risk reduction and the establishment of safe systems of work, and are now key to EU law (Clarke 1999). However the use of RAs in the real world has been strongly criticised; the HSE (2003) has regarded them at times as of little value, generic, and including no operative consultation.

But even with best intentions in terms of creating RAs and their implementation, one thing cannot be legislated against: the choice to take a personal risk. Management cannot be everywhere and see everything that occurs on site. It must come down to individuals and their personal responsibility for their own behaviour. This is not new thinking. Robbins (1972) asked for more emphasis on personal responsibility for safety in the workplace, and through a variety of government legislation and industry safety programmes, it has become a key element in site safety management.

However, both legislation and the myriad of safety programmes all neglect one key factor when placing responsibility with individuals. They ignore the fact that people like to take risks. They follow the theory of risk compensation, which suggests that everyone has a risk thermostat, and this should be set to zero (Adams 2006). They cannot account for deliberate risk-taking, they see it as abnormal (Douglas 1992).

Consequently, in many cases, risk-taking is simply assumed to be caused by inadequate safety knowledge and deficiencies in education and training (HSE 2003). But training is not a panacea. There are other fundamental issues, both in the industry structure and its operatives, that will have an influence on risk-taking behaviour, issues that are unlikely to be resolved by training alone. There are many positive reasons for taking risks, and any safety interventions that do not affect the setting of individuals' risk thermostat are likely to be frustrated by behavioural responses that return the acceptable level of risk to that with which the individuals were originally content (Adams 2006).

METHOD

In order to further investigate attitudes and other underlying drivers behind risk-taking behaviour, informal interviews were held with six craft workers and operatives regarding real life incidents in which they had been involved (Tijhuis 2001). Focus on

a particular incident in their past allowed workers to tell their stories in detail, to explain why they took the risk they did and their feelings and understanding of the situation. Probing of the motivations by the interviewer (Silverman, 2001) revealed the underlying motivations for the behaviours as the story unfolded.

The interviews were recorded using note-taking, and these notes were then condensed into short stories, told from the interviewee's point of view. Keeping this perspective of the incident ensures the focus of the findings remains with the worker and their perceptions and opinions are maintained within their natural setting (Geertz 2000).

This perspective also facilitated the validation of the summarised data; each story was then given back to the interviewees for their approval and confirmation that it was an accurate and comprehensive record of the situation concerned (Seale 2004). These stories have been produced with their agreement.

Analysis of the stories was then made, drawing out key themes, patterns, regularities and irregularities (Coffey and Atkinson, 1996), ultimately identifying the key factors of influence and motivation underlying their risk-taking behaviour and general attitude towards risk.

The sample was one of convenience. Some of the operatives had been involved in an incident that was recorded by site management, others were recalling recent incidents where they had taken a risk. All the operatives had some form of safety training and had at least five years experience in the work they were undertaking.

FINDINGS: THE STORIES

The Tree Surgeon's story

We had to reduce a big poplar tree on this site by 20%. The safety guy from the contractor we were working for came down at the start of the job to check risk assessments, that we'd put cones out and the like, crossing all the 't's. He was concerned we didn't have adequate ear protection for the chipper, just for the chainsaws and so on. But in my opinion the biggest risk was the tree. They'd let it grow too much, it had a 70 foot spread with limbs sheared out, all long thin branches. They'd have been better Pollarding it, just cutting it off to the trunk and letting it grow again, but they didn't want that. I had to go out on those thin branches to reduce it. I think we took a risk with that job, Poplar's brittle, you don't know what it's going to do, it would have been safer to Pollard it. We later found out that they'd asked another company to do it, but they'd insisted on using a MEWP, which would have been the best way, but the contractor didn't want to pay for it. They asked if it could be done without, and yes it could, but it wasn't the best or safest way. They come on site worried you've not got a high viz on when there's no one else around, but want you to take a risk with a tree to save a few quid. It's all paper safety these days.

The Cable Puller's story

We were pulling the mains along the corridors, the kind of cable most people can't even lift, never mind bend round corners. It was all open ceilings with all the trays and pipes on show, and we were at this corner and the tray we're laying in is right over next to the wall and the gap you're supposed to get in is right in the middle. So you've no chance of reaching and bending through this hole to get the cable down in the tray and clipped on. No chance. We had a little MEWP (Author's note : Mobile Elevated Working Platform), a corridor sized one, but that wouldn't fit up the gap, it was too small, so I climbed out and up into a couple of the other trays to get this cable

in. That's when the site supervisor saw me and ordered me down. The trays were fixed on, they would hold me, I'm not that big, but the supervisor wanted to know how I knew they would hold? Did I fix them? Well, no, but we needed to get the job done. The supervisor did explain they'd only stopped me because they didn't want me getting hurt, and we agreed that designers didn't know what they were doing. Why put that cable furthest from the opening? Why design the ceiling so it's too small for anything to get up and reach across other than your head and one arm? They should try fitting some of this stuff, might make them realise. Anyway, the site supervisor went and got the M&E supervisor and sent us out for a smoke, we were getting really cheesed off, we'd been struggling on this job all along and people kept stopping us, how were we supposed to make our money? When we came back the M&E supervisor had agreed to take some of the other trays out so we could get the MEWP in properly. To be fair, it didn't take too long to sort and the site supervisor was just looking out for us in the end. But things should be better designed and thought through properly.

The Window Fitter's story

We were fitting window frames on the 2nd floor of the building off an external scissor lift. All the staircases were blocked so there wasn't any access in the building. We were under pressure to get the job done, both from the contractor and we were on price. In order to get inside, I lifted the scissor up to the window level and used the door to climb in through the window. It wasn't ideal, but I took action and thought it was safe. There was a hop up inside to climb down onto and the scissor was only an inch, if that, off the building. I couldn't have fallen. I eliminated the risk. But one of the managers saw us and I got a verbal warning. I'm not in the practice of doing stupid things. There's a risk in every job and I minimise it as best I can. Safety has gone too far, it doesn't allow you to do your job any more.

The General Operative's story

We needed to fit a closure piece into the curtain wall movement joint about 7m off the ground. There had been a scaffold there which I could have easily reached off, but the top had already been struck, leaving only a lower platform. To reach up we lifted a podium step up onto the scaffold and then I had to stand on the handrails of this to reach the joint. What I was doing didn't really come into it. It needed doing, and it needed doing then, I suppose I shouldn't have been doing it, but it was a two minute job and with the cost and time to put the scaffold back up, and it would have delayed the floorers too. That platform had to come down that day anyway, there wasn't time, one of my mates was footing me, it was fine but just looked bad. It wasn't the right way to do it but it was the easiest. It was my fault it needed doing like that anyway as I missed the scaffold strike, I should've done it the day before. I was probably most afraid of getting caught.

The Electrician's story

I was doing some work up a stairwell, so I footed two ladders at the bottom, placed across each other so I could put a scaffold plank across to make a platform. I was quite happy working off it, they were both my ladders, class one, and I made sure I chose a very good board! I knew it wasn't going anywhere, anyone with a grasp of physics would've known it wasn't going anywhere. But the client on this job had his own health and safety inspectors, they'd come and do spot checks, and they caught me. They insisted I get a proper scaffold, which I did and charged the client because I hadn't priced for it, all to do the ten minute job I was up there for. I know it wasn't a

proper platform, I could step off in theory, they have to assume there are some idiots on site I guess, and if I'd dropped anything I hadn't cordoned it off, although you would've known I was there, you couldn't get up the stairs with me in the way. I do appreciate it, but you make your own decisions at the end of the day.

The Roofer's story

We were fitting the flashings to this kalzip roof out of a scissor. When we got round to the next elevation, I saw we'd left a lanyard on the roof. We were always getting a bollocking for not clearing up, so I just went onto the roof to grab it. The engineer saw me and went mental. I got thrown off site for the day for doing that. For tidying up! I wasn't going to fall, I suppose I might have slipped, but I wasn't going to, I'm on that stuff all the time, you know how to walk on it. I know you're not supposed to get out of the scissors, go from one to the other like, but it got it done there and then. I suppose it was fair enough, it's the management's job at the end of the day, but still, I was alright, I knew what I was doing. I wouldn't do it again, not when anyone could see at least. Lost me a days money that did.

DISCUSSION

The attitude towards risk highlighted within the vignettes forms a clear pattern; there appears to be a high tolerance for risk within the construction industry workforce. In four of the case studies, the risk was not even initially perceived by operatives. It was not a risk in their opinion, it was what they do every day and their behaviour was not reckless nor out of the ordinary. For the window fitter, although the risk was acknowledged, it was considered eliminated, despite the fact that the behaviour was deemed unsafe by site management.

The Tree Surgeon's case studies is irregular to this pattern. The risk here was clearly identified, possibly only due to that skilled operative's particular knowledge and understanding of his trade, although yet again the risk was still taken.

However, in all the case studies the specific risk-taking behaviour under examination was considered by the operatives, for a variety of reasons, to be 'not right'.

Awareness of correct work methods and safe behaviours is clearly present within the workforce; indeed several operatives actually knew in detail the risks associated with that particular behaviour, they have been trained and educated. But only in one case study (that of the Tree Surgeon) were the words 'risk', 'dangerous' or 'unsafe' used by operatives to describe their actual behaviour in that instance. What are deemed as risk-taking behaviours by some, such as site management, are clearly accepted by operatives as part of the work.

The underlying motivations behind taking risks appear to fall into two distinct spheres of influence; those of a personal nature and those that are seemingly created by the 'management'. This term was used to refer to anyone above operative level and was also in part a manifestation of other factors specific to construction site culture.

On a personal level, operatives are clearly influenced by fundamental human psychological factors; the timing of a task; the argument that 'it's a two minute job' is a clear indicator, over optimistic, that nothing can go wrong in just two minutes. Confirmation of autonomy was also evident, '..you make your own decisions..', '...I took action...', emphasises the independent choice made by the operatives when they took the risk. The site culture itself also influences the personal attitude to risk taking behaviours, especially in the motivation of money. Work on price means a delay due to health and safety is a delay that cannot be afforded, operatives are at work to earn

their money as fast as possible. This is also strongly linked to the need to get the job done. Whether working on price or not, the need for productivity is a key influence in the decision to engage in risk-taking behaviours.

Frustration with 'management' was also evident and in certain cases seen to be the underlying cause for risk-taking behaviour. Through poor management of the work site, by applying pressure for production, in the fundamental design of the structure or simply to save money, 'management' are seen as an additional factor of influence upon the individual to take a risk.

All the operatives interviewed for this study do take risks, which was the reason for their inclusion, however the influences and motivation behind their specific behaviour is also behind the behaviour of every other operative within the construction industry workforce. With the exception of the Electrician, all the operatives used the term 'we' when talking about their work, they work in a gang and this behaviour was clearly acceptable within that gang. A high risk tolerance is arguably part of the culture of the construction site, and risk-taking behaviour unlikely to be uncommon.

CONCLUSIONS

This paper forms a preliminary investigation into risk tolerance within construction industry operatives and the influences of the underlying construction site culture. Whilst the small number of interviews undertaken does not allow for generalisation of the findings, it can be argued that these personal experiences and attitudes are unlikely to be uncommon.

Both the human physiological factors and the culture of the construction site, as discussed within the literature review, were found to have some influence on risk-taking behaviours. For some operatives, personal benefits both tangible in terms of money or abstract in terms of self-development and autonomy may lie behind these behaviours, and the culture, and occasionally the management structure, in which they operate would appear to do little to discourage them.

The high tolerance to risk-taking found within the construction operative workforce can be seen as indicative of the requirements for the work. Construction is often seen as risky by the general populace (Cooper and Cotton 2000), but is not considered a risk by operatives even when acknowledged boundaries of safe working for the task are stretched or broken.

This knowledge and understanding of safe working behaviours found within the workforce also implies that training and education are unlikely to provide a simple solution. It is the personal choice to ignore this knowledge that leads to risk-taking behaviours, which is far more difficult to counter.

The vision of zero risk tolerance in craft workers and operatives may indeed be an unattainable goal. To seek to remove all risk from a industry where risk-taking and tolerance to risk form a fundamental part of the culture and nature of the work is an undeniable challenge. As Douglas (1992) questioned, 'rather than how safe is safe enough?', the question that possibly should be asked is 'how safe is safe enough for this particular culture?' This now asks far more about construction site culture than the risk tolerance of the individuals who work within it. A better understanding of the complexities of this culture, and its compatibility with the current quest for improved health and safety on sites is clearly required.

And indeed the investigation detailed here does form part of a larger PhD work investigating construction site culture and its impact and influence on health and safety on sites. This small study has established an informed platform for further research on the specific subject of risk taking in construction site operatives, and has also provided some insight into the construction site culture as a whole.

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