CHAPTER

CONTRACTORS' COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY LEGISLATION IN SOUTH AFRICA: THE BENEFITS OF SELF-REGULATION

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SUMMARY

Occupational health and safety [OHS] laws are not always ahead of their times in developing countries. Thus, compliance with OHS laws could be pedantic but superficial to contractors. In addition to meeting legislative requirements, evidence suggests South African contractors also self-regulate, and this further impact their health and safety performance beyond the remit of legislative guidelines. However, what do a commitment to self-regulation and the transition between self-regulation and compliance with OHS regulations entail in a typical construction company in South Africa? The study examines the various levels of self-regulation and compliance to OHS legislative requirements in South Africa, and how these impacts the number of accidents on construction sites. This chapter seeks to answer this question and research objective using a 20-item scale to develop a conceptual framework that helps to explain the relationship between contractors' commitment to work safety culture, self-regulation and Accident Frequency Rates [AFR]. The study found that there is a high level of self-regulation ranging from 65% to 97%, and an average AFR of 1.02 accidents per 100,000 hours in South Africa. It also emerged that there is a significant linear negative relationship between the level of contractor self-regulation and AFR. The study concludes that the more contractors self-regulate, the lower is their AFR. It is recommended that public and private sector clients encourage the use of voluntary self-regulation towards strengthening contracting organisations' ability to prevent accidents on construction sites.

Number of Figures: 5
Number of Tables: 1

Introduction

Self-regulation aims to implement ways that help to lower the number of accidents on construction sites. According to Gunningham (2011), self-regulation provides a means whereby the government prescribes an outcome but does not outline how and what the industry must do to achieve that particular outcome. In the case of the construction industry, this outcome is to enhance health and safety and decrease the number of accidents on site. An examination of Occupational Health and Safety (OH&S) in the South African construction industry reveals that there are two primary acts. The first one being the Occupational Health and Safety Act No.85 of 1993 (OHSA) and the second is the complementary Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COID Act). The OHSA was implemented by the Department of Labour (DoL) and superseded the Machinery and Occupational Safety Amendment Act No. 40 of 1989, the Machinery and Occupational Safety Amendment Act No. 40 of 1989 and Act No. 97 of 1991 in an attempt to give more importance to health and safety in the construction industry.

The South African construction industry does not lack health and safety regulations and legislation, however, the number of fatalities, accidents and injuries in the industry is still on the rise (FEMa 2014). According to FEMa (2014) as at December 2014, there has been a total of 2797 accidents in South Africa. The Construction Industry Development Board ([cidb] 2009) reports that the construction industry has the third highest fatalities frequency per 100 000 workers. The main issues that contribute to poor OH&S compliance and high accident frequency rate on site are firstly the poor mindset of contractors towards a safety culture (Windapo, 2013), secondly a lack of enforcement of safety regulations in practice (cidb, 2009) and thirdly, the impact of the human element on OHS (Hamid et al., 2008).

Windapo (2013) addresses the first issue relating to OH&S which is the mindset of the leadership of construction companies who tend to favour financial gain rather than a safety culture. Geminiani et al. (2008) and cidb (2009) address the second issue which is the lack of enforcement of the health and safety regulations in practice. The OH&S Inspectorate positioned within the DoL in South Africa is responsible for the enforcement of OHSA and according to the cidb (2009) the department conducts site visits/blitzes inspection infrequently and ineffectively. The human element impact is the third issue considered as affecting the poor record of health and safety among contractors in the construction industry (Hamid et al., 2008). The human factor theory as explained by Goetsch (2009), emphasizes accidents caused by a human error due to the inappropriate response of workers, negligence, lack of experience and poor attitude towards training. To bring about a change in the mind-set of construction company leadership towards a safety culture, promote compliance to OH&S in practice, there needs to be a paradigm shift to instil health and safety culture into the mentality of the management of contracting firms. This study posits that self-regulation to OHSA legislative requirements provides one of the ways through which the problem of accidents on construction sites in South Africa can be addressed.

Studies conducted in the US and New Zealand by Gunningham (2011) and Scharrer (2011) respectively, demonstrate that the self-regulatory approach to OH&S has resulted in a reduction in fatalities/accidents on construction sites. Windapo et al. (2018) established that there is a high level of self-regulation amongst South African construction organisations even though these companies operate under poor incentive regimes. One view about enforcement of OH&S legislative requirements may be the fact that contractors are not only complying with regulations due to their legal obligations but are in fact self-regulating. However, there is limited research into the use of self-regulation as an approach to compliance with OH&S

legislative requirements in South Africa and a lack of knowledge on whether self-regulation impacts on the number of accidents towards improving H&S performance on construction sites. Since there is a dearth of research on the impact of self-regulation by contractors on performance in South Africa, the arguments put forward by researchers such as Gunningham (2011) and Scharrer (2011) that self-regulation to OH&S results in a reduction in fatalities/accidents on construction sites, remains purely theoretical in the South African context. The study reported in this chapter examines the various levels of self-regulation and compliance to OH&S legislative requirements in South Africa and how these impacts the number of accidents on construction sites. Specifically, the chapter intends to answer the question - what do a commitment to self-regulation and the transition between self-regulation and compliance with OHS regulations entail in a typical construction company in South Africa and how does this behaviour impact performance with regard to the number of accidents?

The Concept of Self-Regulation and Occupational Health and Safety

Levels of Self-Regulation

'Direct' or command-and-control regulation, which is based on the state setting and enforcing standards with punitive measures, has not performed to expectation hence the advent of self-regulation (Aalders and Wilthagen 1997). Unlike command-and-control regulation, which is fixed, self-regulation is flexible and a spectrum (Windapo et al., 2018), pure-self-regulation at one end and command-and-control on the other end (Sinclair 1997). Within this spectrum are various levels or categories of self-regulation including co-regulation, mandatory self-regulation and pure or voluntary self-regulation. Self-regulation varies from country to country and industry-to-industry hence can be categorised into various levels. Rees (1988) argues that an entity's commitment to self-regulation can be assessed at three main points covered below. According to Gunningham (2011), in ‘voluntary self-regulation’, there is no external involvement in rules making and enforcing, all are within the organization or the industry; in the ‘mandated full self-regulation’, rulemaking and enforcement are privatised. While both are privatised, the government formally sanctions the regulatory program in the mandated full self-regulation but not the voluntary self-regulation. This external involvement is for monitoring the effectiveness of the regulatory system towards any possible modifications. The third level is the ‘mandated partial self-regulation’, where either rulemaking or enforcement is privatised. According to Korosec (1990), the options here are ‘public enforcement of rules written privately’ and ‘internal enforcement of rules written privately as mandated or moderated by government’.

Self-Regulation Practices

In the current study, the self-regulation practices at organisational level are based on those identified in Levinson (1984) namely, H&S Policy, H&S Plan, OHS Management System, H&S training and Personal Protective Equipment. Health and safety policy as a written statement of the principles and goals representing an organisation's commitment to maintaining a safe and healthy workplace. The persons responsible for certain actions and the details of how to achieve the aim of the policy are covered in it. An Occupational Health and Safety Management System (OHSMS) or OHS Programme is a part of an extensive organisational management system used to establish OHS policies of an organisation and to manage OHS risks (International Standards Organisation 2018). Most OHS management systems are based on the ‘Plan’, ‘Do’, ‘Check’ ‘Act’ Model. The education and awareness aspect is the OHS training which, according to Robson *et al*. (2012), is the planned efforts to facilitate the learning of competencies that are specific to OHS.

Overview of the OH&S Regulatory Framework in South Africa

OH&S in the South African construction industry is overseen by two legislative Acts. First, the OHSA No. 85 of 1993 oversees the protection from hazards and the health and safety of persons at work and, of persons other than persons at work. The second is the Complementary Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COID Act) which covers compensation for accident and diseases relating to health and safety. A key secondary legislation from the OHSA Act is the Construction Regulations (CR) of 2014, introduced due to the poor H&S statistics in the construction industry. CR recognises and allocates specific responsibilities to construction stakeholders such as clients and designers. For example, clients or project owner are required to include H&S specifications in tender documents and to ensure that the principal contractor makes the right allowance for H&S. The enforcement of the OSHA is the responsibility of the OH&S Inspectorate of the Department of Labour (DoL), but they perform below expectations (see cidb 2009). This is where the frequency and efficacy of site visits and blitzes inspection by DoL is questionable.

The relationship between levels of Self-regulation and OH&S Safety Performance

Extant literature (Levinson, 1984; Gunningham and Rees, 1997; Castro, 2011; Scharrer, 2011; Gunningham, 2011) have shown that self-regulation has numerous benefits over the traditional state-imposed regulation. These benefits include speed, flexibility and lower costs. Rees (1988) established that industry self-regulation led to a significant drop in accident rates on a nuclear plant project on which about 4500 workers were employed.

The conceptual framework of the study is presented in Figure 1. The study is based on the concept that the aggregate levels of self-regulation adopted by a construction company on site, is related to accident rates. The conceptual framework is based on earlier studies by Levinson (1984); Gunningham and Rees (1997); Castro (2011); Scharrer (2011) and Gunningham (2011). There is limited research in South Africa on whether self-regulation impacts on the number of accidents on construction sites and therefore stimulate improved H&S performance.

Figure 1: Conceptual Framework of the Study

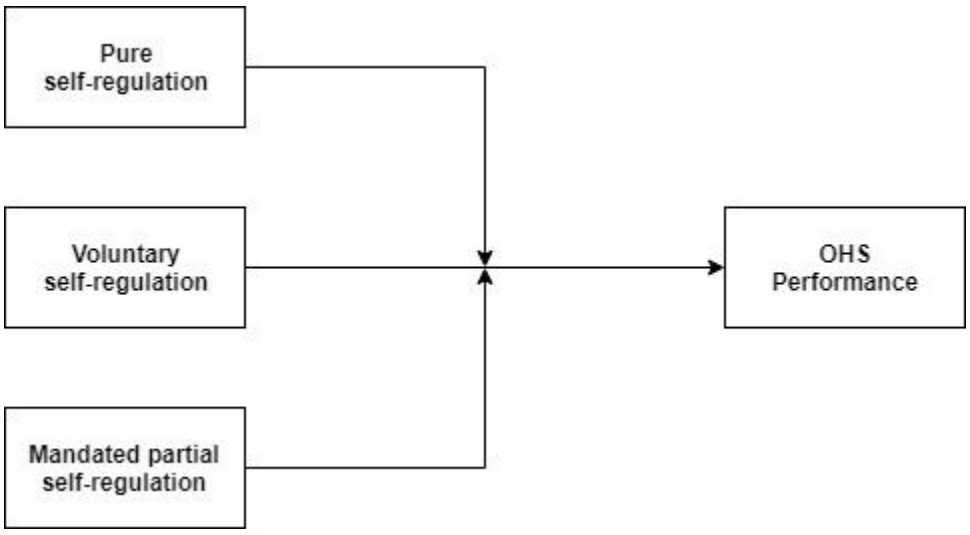


Figure 1 shows that self-regulation (comprising of pure self, voluntary and mandated partial) impacts on the number of accidents on construction sites.

Methodology

As the research questions meet the criteria for the pragmatic research paradigm, a mixed methods research approach (involving interviews and surveys) was used to collect data. Here, the research questions determined the epistemological, ontological and axiological position of the research (Saunders et al. 2009). An organisational level of regulation is a requirement that all organisations listed on the Professionals and Project Register must meet; hence, the scope of the research is limited to this.

Following an extensive literature review, the data collection instrument was developed. The 20 questions, as shown in Figure 2, were based on the self-regulation practices in Levinson (1984) namely, H&S Policy, Plan, Management System, Training and PPE use. While there were questions on the profile of the respondents and their organisations, the 20 questions centred on enquiring on the organisation's commitment to creating and maintaining safe working conditions, established health and safety plan, safety awareness initiatives. Following the developed questionnaire, experts objectively vetted and pretested it, paying attention to their importance to the subject of self-regulation, among many, their coverage of the entire topic. This was for internal validity purposes. Further, a control question, although not related to self-regulation, was used to test the respondent's consistency in answering the questionnaire. The external validity was based on comparing the results of the study with previous research.

Using probability sampling technique, the sample frame was obtained resulting in a sample size of 617 organisations. The population (N=1234) included all organisations listed in the Professionals and Project Register 2014. For the survey, questionnaires were sent to the 617 organisations to determine the level of self-regulation by construction contractors in South Africa as they strive to meet OHS' legislative requirements. Three construction organisations were selected for follow up interviews based on their willingness to participate in the sessions.

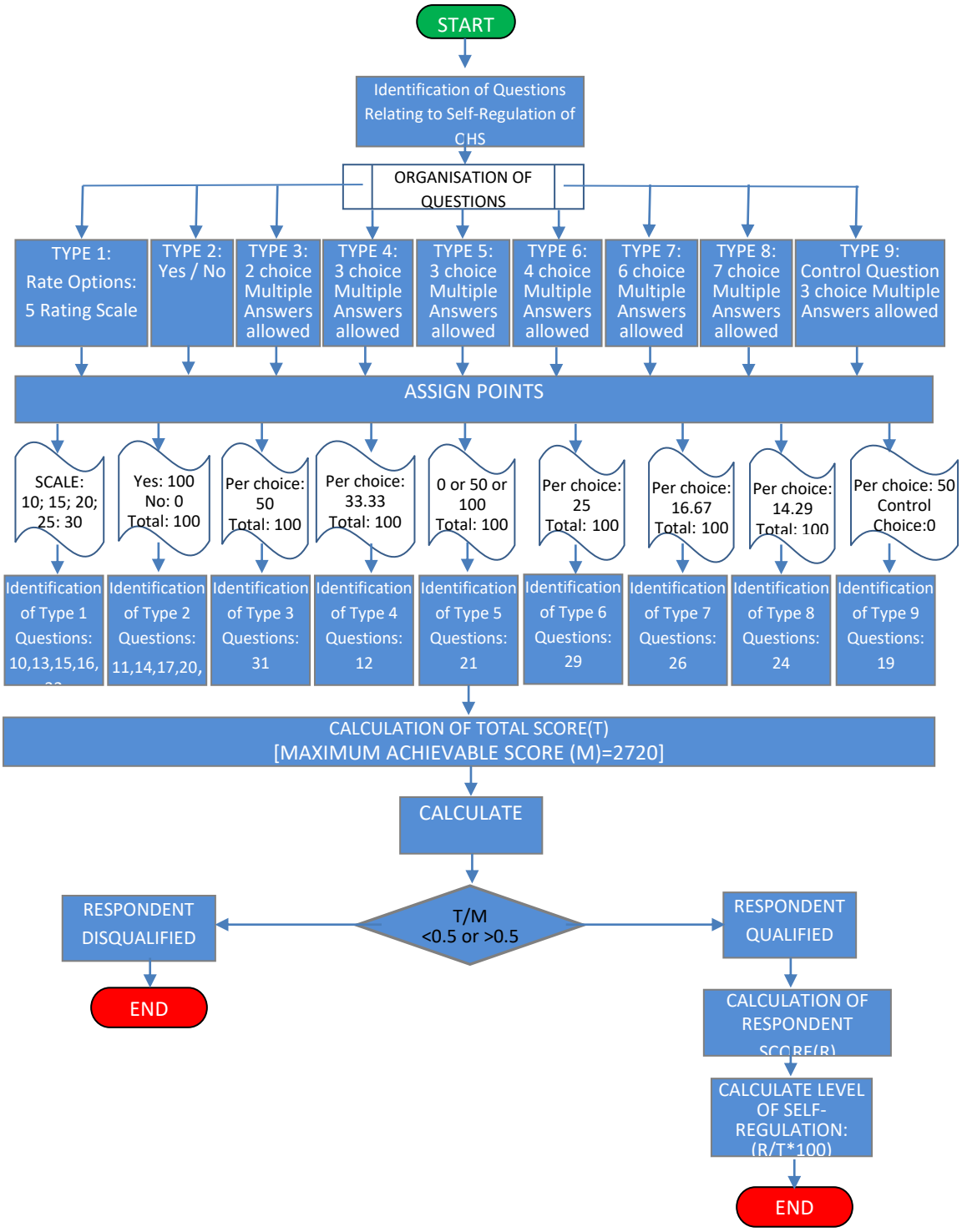
An analytical framework, detailed in Windapo et al. (2018) was developed to compute data relating to levels of self-regulation. The quantitative data had to be analysed such that a level of self-regulation for each respondent could be determined. A particular sequence of processes outlined in Windapo et al. (2018) was considered in determining levels of self-regulation by South African construction contractors towards meeting their considered OHS in-house objectives and meeting operational requirements mandated by the government (See Figure 2).

The accident rates used as performance measure were obtained from the contractors surveyed. The question posed allowed the respondents to give the Accident Frequency Rates (AFR) on an identified project per 100,000 hours. Pearson 'rho' correlation coefficient analysis was used in determining whether there is a significant relationship between the level of self-regulation by the South African construction companies surveyed and AFR. When Pearson's 'r' is close to 1, it indicates that there is a strong relationship between the level of self-regulation by construction companies and AFR and a weak relationship when 'r' is close to zero. A negative Pearson's 'r' indicates an inverse relationship between the variables (Fellows and Liu, 2015).

Results

Following the distributed questionnaires online, 59 were returned and used, a response rate of 9.72%. The low response rates obtained was probably as a result of the sensitive nature of the information requested on H&S practice and performance. This casts doubts on the generalizability of the results to the study population. This limitation was strengthened with the use of interviews. Majority of the respondents (19) work for Grade 7 contractors listed in the General Building and Civil Engineering categories but the entire respondents are employed by contractors listed in Grades 4 to 9 of the cidb Register of Contractors in South Africa. The respondents are well experienced in the construction industry and educated, for example, 78% have over 10 years of experience in the construction industry and at least 47% have a Bachelor's and a higher level of academic qualification. While it can be argued that this will skew the data collected to only experienced persons, it should be noted that while the level of experience varies, the experienced respondents 'worked' they way up. By implications, they once had a lower level of experience hence likely to draw on them. The implications of the profile of the respondents include the potential of the respondents providing valuable, relevant and meaningful information useful for this study and the representation of the demographics of the population.

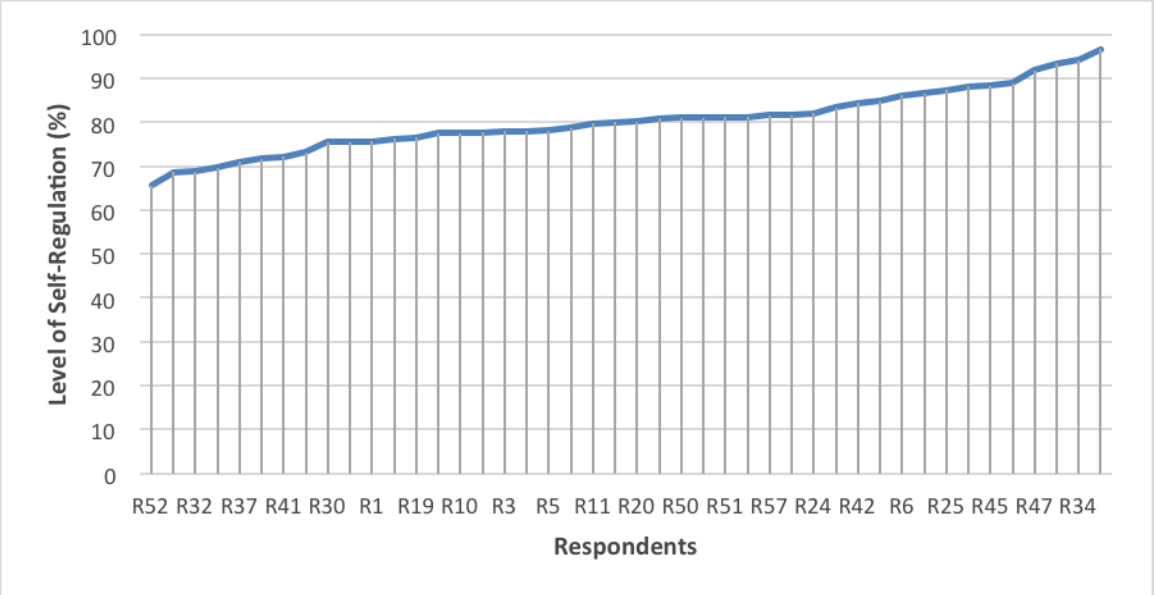
Figure 2: Self-Regulation Analytical Framework
Source: Windapo et al. (2018)



Level of Self-Regulation

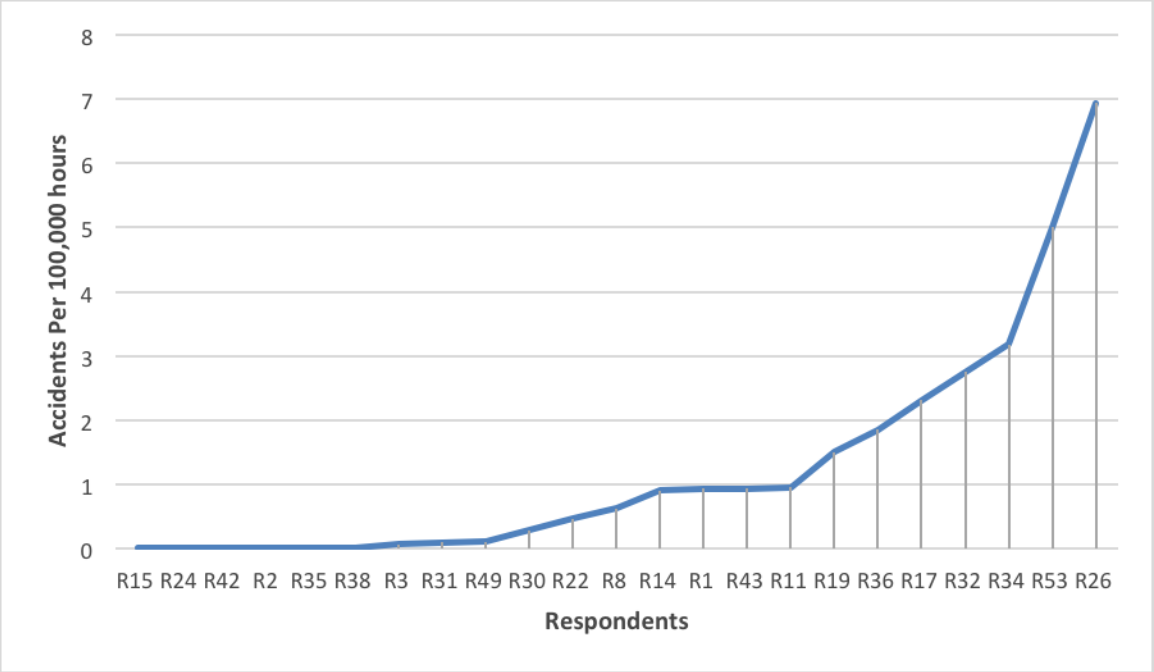
Figure 3 shows the graphical presentation of respondents and their corresponding level of self-regulation to OHS requirements, derived from the analysis of questions related to self-regulation using the framework detailed in Windapo et al. (2018). The study showed the mean level of self-regulation of 80.35% and a standard deviation of 7%. There was a high level of self-regulation among the respondents, ranging from 65% to 97%. This suggests a very high level of self-regulation for the responding companies.

Figure 3: Level of Self-Regulation of the Respondents
Source: Field survey



Accidents Frequency Rates (Accidents per 100,000 hours)
The Accident Frequency Rates (AFR) is presented in Figure 4. The AFR ranged from 0 to 6.94 accidents per 100,000 hours while an average of 1.02 accidents per 100,000 hours was obtained for the 23 respondents that provided information. Six respondents reported zero accidents which may suggest misreporting by the management of organisations.

Figure 4: Accidents Frequency Rates (Accidents per 100,000 hours)
Source: Field Survey



The relationship between the level of Self-regulation and Accident Frequency Rates (AFR) on construction sites

The study sought to find out the type of relationship between the two variables – the level of self-regulation to OHS regulations and Accidents Frequency Rates (AFR). The type of relationship between the two variables was established by analysing the data presented in Figures 3 and 4, using Pearson 'rho' correlation analysis. A graphical presentation of the relationship is presented in Figure 3, while the correlation statistics are presented in Table 1.

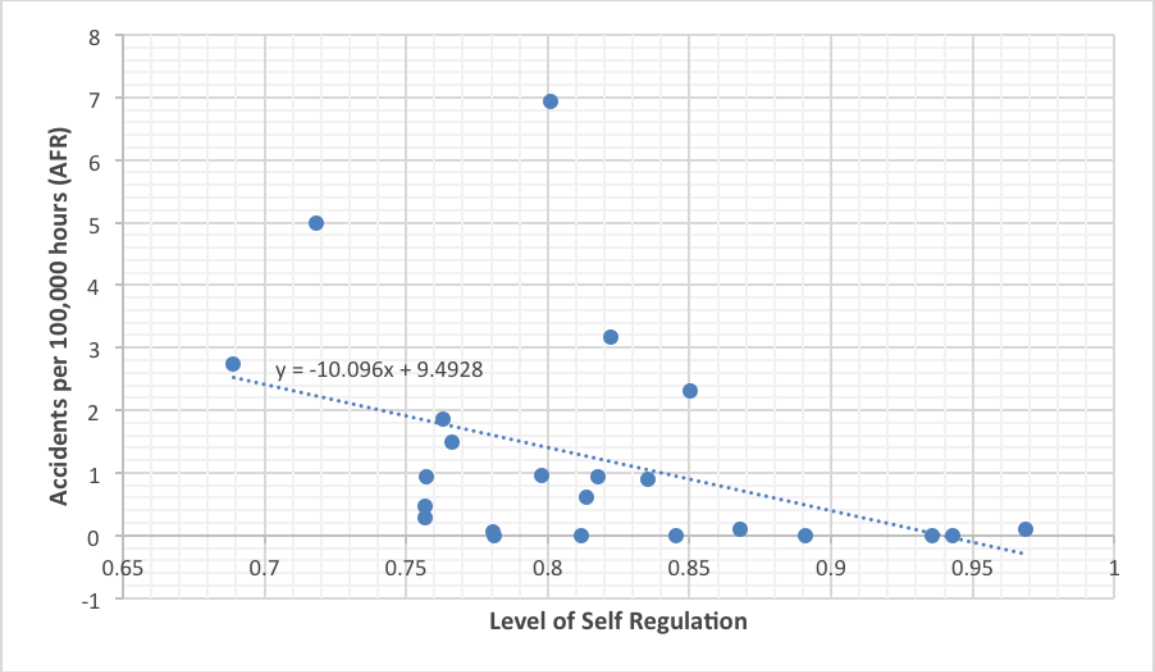
Table 1: Pearson Correlation Statistics (Level of Self-regulation and AFR on construction sites

		Level of Self-regulation
AFR	Pearson Correlation	-0.405*
	Sig. (1-tailed)	0.027
	N	23

* Correlation is significant at the 0.05 level (1-tailed).

Figure 5 and Table 1 shows that there is a negative linear relationship between the level of self-regulation and AFR. The Pearson correlation coefficient is -0.405 (see Table 1) which indicates a negative correlation. It can be deduced from these findings that the higher the level of self-regulation of a contractor, the lower the AFR and that the correlation, though below average is statistically significant at the 0.05 level (1-tailed).

Figure 5: Scatter plot diagram between Level of Self-regulation and Accident Frequency Rate (AFR)
Source: Field Survey



Interview Results

The three semi-structured interviews did not only triangulate the results of the survey but also offer new insight into the subject. The study sought to know the views of the respondents concerning the concept of self-regulation in South Africa, the level of self-regulation adoption by construction organisations and whether there is a relationship between the level of self-regulation and AFR on construction projects. The interview respondents were well experienced in construction and OH&S. In particular, Interviewee 1 was a professional project manager with over 20 years of experience in construction, including heading OHS and tender management unit of a prominent contracting firm in Western Cape. A medium-sized building construction firm in Johannesburg was represented by an H&S officer with more than five years of experience in the construction and building industry, Interviewee 2. Lastly, the third interviewee had more than 18 years of experience in managing various sizes of multi-disciplinary engineering projects from inception to client handover, a Registered Quantity Surveyor and an Acting Chief Executive Officer of a construction firm that specialises in civil and mining works. The implications of the various scopes of experience are that one respondent presents more than one point of experience. In other words, the points of experience are more than three. Patton (1990) describes respondents like these as 'information-rich cases' because they provide information-rich data.

While interviewees 1 and 2 agree that self-regulation at the organisational level is critical for OHS improvement, Interview 1 views that a prerequisite for organisational level self-regulation is dedicated training and a better appreciation of the purpose of OHS legislative requirements. However, Interviewee 2 stressed the obligation for H&S in that the contractors have a duty to ensure that their workers comply with H&S procedures. By implication, this interviewee suggests that H&S of workers should be non-negotiable. Interviews 3 added an interesting perspective, the size advantage of larger contractors. The respondent views that small contractors have limited resources as against the large contractors who have more sources and able to establish, for example, an H&S administrative unit. Interviewee 1 and 2 view that a higher level of self-regulation by construction companies, the lower the AFR would be. Interviewee 1 further commented that the level of self-regulation is enabled by construction institutions such as Master Builders Association (MBA), South African

Federation of Civil Engineering Contractors (SAFCEC), Occupational Hygiene Safety and Associated Professionals (OHSAP) and South African Institute of Occupational Safety and Health (SAIOSH) who provide assistance to safety managers to ensure compliance.

When questioned about whether the level of self-regulation should be employed as a panacea to accidents on construction sites, Interviewee 1 views it should be only "with suitable training and planning." Likewise, Interviewee 2 contends that self-regulation will not eliminate accidents absolutely, but it is a leading factor that drives stakeholders towards good H&S practices. Interviewee 3 recommends outsourcing H&S to specialised organisations who are more knowledgeable about health and safety as a way of reducing accidents, injuries and fatalities on construction sites.

Discussions

The cross-sectional survey and interview results were found to be similar when compared to each other. The evidence of the high level of self-regulation to OHS requirements within contracting firms in South Africa with a mean score of 80.36% and a standard deviation of 7.10% offer optimism to the efforts to improving OHS. The interviews indicate that higher grade contractors self-regulate better than other forms of construction organizations. The quest to save cost by these contractors is a possible explanation for the high level of self-regulation. In particular, Windapo (2013: 78) found that 'perceived cost savings are unrelated to the degree of risk, which the regulation is trying to prevent'. OHS regulation remains the foundation on which OHS improvement strategies are based without which the strategies are ineffective (Finneran and Gibb 2013). Many findings of the current study are consistent with previous studies. For example, while it validates the self-regulation practices, for example OHS policy, identified by Levinson (1984), it is consistent with the findings of Umeokafor (2016). Umeokafor (2016) in examining, among many, the extent of various types of construction OHS self-regulation in the Nigeria including pure, industry and enforced self-regulation indicates that contractors there mostly adopted that pure H&S self-regulation followed by enforce self-regulation. However, the OHS self-regulatory regime in Nigeria differs with that of South Africa in many ways, for example, there are local OHS laws for the construction industry in South Africa but no local ones for the Nigerian construction industry as at when Umeokafor (2016) was conducted.

It is interesting that the interviews indicate that some contractors view OHS as a duty. In being consistent with the findings of Umeokafor (2016) where viewing OHS as a duty is a key driver of OHS self-regulation in Nigeria, other views of another interviewee on the imperativeness of training on OHS for self-regulation is also consistent with the findings of Umeokafor (2017). Umeokafor (2017) found that the lack of awareness of OHS is a major barrier to OHS self-regulation. The inability of smaller contractors to self-regulate as the large ones, a finding of this study, is consistent with literature, for example Finneran and Gibb (2013). It is tempting to agree with the respondents who recommend outsourcing of H&S to experts. However, this is likely to undermine efforts towards integrating OHS into the management system of organisations. There is also a risk of OHS being a standalone system instead of integrating it into the management systems of organisations or projects.

The study established that there is a significant relationship between self-regulation and AFR which is both confirmed by the quantitative and qualitative research approaches. The interview respondents viewed that higher self-regulation by contractors will result in lower APR on construction sites and this is confirmed by the survey results and agrees with extant

literature (Castro, 2011; Scharrer, 2011; Gunningham, 2011; Gunningham and Rees, 1997; Levinson, 1984) that have shown that self-regulation has numerous benefits over the traditional state-imposed regulation. Furthermore, it emerged that OH&S managers oversee the self-regulation role in construction companies and take responsibility for AFR, aligning with Levinson's (1984) view that self-regulation can be achieved through internal monitoring.

Conclusions and Recommendations

The research examined the level of self-regulation to OH&S requirements among contractors in South Africa and whether this is related to Accident Frequency Rates (AFR) on construction sites. It emerged that the level of self-regulation to OH&S requirements by South African contractors is high. Also, it was found out that the average AFR on construction sites is 1.02 accidents per 100,000 and that there is a statistically significant negative relationship between the level of self-regulation by construction companies to OH&S legislative requirements and AFR in South Africa. Based on these findings, the study concludes that construction companies in South Africa are not indifferent to H&S regulations suggesting that the more contractors self-regulate, the lower the AFR.

Despite the high level of self-regulation found in the study, in line with literature and the emphasis on the imperativeness of training and planning for adequate self-regulation, the regulator of OHS and the government should increase the emphasis on training and creating awareness on OHS. The government should support and inspire contractors to self-regulate through measures such as tax incentives and giving preference to contractors that self-regulate in terms of OHS in the prequalification of contractors on public projects. The limited sample of the qualitative aspect of the study is acknowledged as a limitation, and thus the results should be viewed as indicative. Also, the reliability of the accident statistics is open to debate because of confidentiality, reputation, lack of accident record enforcement and the resource-intensive nature of reporting construction accidents. Through a comparative study, further research can improve and validate the analytical framework as a tool for measuring self-regulation. Further, a comparative study can also investigate the extent that leading and lagging H&S performance indicators and how this happens.

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