Employers’ Beliefs to the Usage of Safety Footwear in the Chinese Construction Industry

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Abstract. This paper reports a work to investigate the employers’ beliefs to the usage of safety footwear in the Chinese construction industry. Questionnaire survey based on the Theory of Planned Behaviour (TPB) is applied as the research technique and six items corresponding to participants’ behavioural beliefs, normative beliefs, and control beliefs were included in the survey form. Investigation was carried out among 15 construction project managers who were in charge of 15 construction projects. The means of the TPB components revealed that participants have positive behavioural beliefs and control beliefs toward the behaviour, while negative normative beliefs to the behaviour. It was suggested that normative beliefs is needed to be improved and there is plenty of room for this potential changing.

1. Introduction
China is urbanizing at an unprecedented rate and is perhaps the greatest human-resettlement experiment in history (Bai et al., 2014), so infrastructure development is urgently required. Since 2010, the Chinese construction market has become the largest in the world (Wang, 2014), but construction site safety records in China, as measured by international standards, are poor (Tam et al., 2004; Hu and Tang, 2013). Construction is one of the most hazardous industries due to its unique nature (Tam et al., 2004; Jannadi and Bu-Khamsin, 2002; Choudhry and Fang, 2008; Khosravi et al., 2014; Li et al., 2015). For outdoor operations, due to the crowding together of workers, the height at which many operations are conducted, and the use of heavy machinery and equipment (Choudhry and Fang, 2008), construction practitioners are vulnerable to on-site injuries.

Migrating peasant workers, who migrating from rural communities to cites to make a living, first appeared in 1970s’ in The People’s Republic of China. After the Chinese reform and open-up, the number of the migrating peasant workers has increased substantially and they make remarkable contributions to the rapid economic development. In recent years, China’s urbanization has driven more and more people from rural communities to cities. According to the newest available data released by the National Bureau of Statistics of the PRC, there were 274 million migrating peasant workers by 2014 (National Bureau of Statistics of the PRC, 2014); as most of them are not very well educated, most of them engage in industry with relatively low requirement of skills, 31.3% of them in manufacturing industry, 22.3% in construction industry, 11.3 in wholesale and retail trade, and 10.2% in service industry. Only 16.7% of migrating peasant workers has retirement insurance, 10.5% of them
have unemployment insurance, and 17.6% of them have medical insurance (National Bureau of Statistics of the PRC, 2014). The construction industry has been overwhelmed with migrating peasant workers because of low requirement of skills; there are 61.1 million migrating peasant workers in the industry, which is more than 90% of labour workers in the industry. Among contributors to production in construction projects, workers are the group with the greatest exposure to danger and to whom most accidents occur (Ulubeyli et al., 2014).

There is a great need to improve practitioners’ safety, especially for the migrating peasant workers, at construction sites in China, and ensuring the safety of the workforce is becoming challenging. Many empirical investigations and theoretical studies on construction site safety have been conducted by Chinese scholars (Choudhry and Fang, 2008; Zou et al., 2007; Wu et al., 2010; Wang and Yuan, 2011; Fang and Wu, 2013; Yi and Chan, 2013; Zhang and Fang, 2013). Personal protection equipment (PPE), such as face shields, earplugs, safety footwear, gloves and hardhats provide basic protection to the workers on construction sites. It is probably because an injury to the foot is not as fatal as that to the head or body that, almost no construction sites in China were equipped with safety footwear revealed by Wu in 2011 (Wu, 2011) and migrating peasant workers in the construction industry seldom use safety footwear; however, foot injuries caused by puncture and compression events are not rare on construction sites. This problem does not address industry practitioners’ and researchers’ concerns, and few studies on this topic have been conducted in China. Safety footwear that has a protective reinforcement in the toe that protects the foot from falling objects or compression, which is usually combined with a mid-sole plate to against punctures from below. The Ministry of Construction of PRC (named the Ministry of Housing and Urban-Rural Development of the People’s Republic of China since 2008), which assumes overall responsibility for overseeing the construction industry in China, released the “Provisions on the Administration of Use of Personal Protection Equipment for Construction Practitioners” in 2007 (Ministry of Construction of P.R.C, 2008). It is stressed that PPE, including safety footwear, must be provided to practitioners without any charge by the construction company. However, free safety footwear provided to the migrating peasant workers in the construction industry is rare (Wu, 2011) and the enforcement of the corresponding administration regulation is not guaranteed.

In the previous work (Suo and Zhang, 2017), migrating peasant workers’ usage of safety footwear in Chinese construction industry has been investigated. This paper reports a supplementary work to investigate employers’ attitude to safety footwear in the Chinese construction industry. Firstly, a questionnaire was constructed based on the Theory of Planned Behaviour (TPB) and six items were included in the survey form; then the survey was conducted with 15 construction project managers, who were in charge of construction projects, to identify the salient influencing factors on the behaviour of providing free safety footwear to workers.

2. The Investigation with Construction Project Managers

2.1 Method

According to the survey with the migrating peasant workers, free safety footwear was not provided to the workers by construction companies and the enforcement of the corresponding administration regulations on safety footwear was not guaranteed in practice, the employers’ attitudes determine whether they provide free safety footwear and also influence whether the workers use safety footwear. It is necessary to investigate employers’ attitude to the usage of safety footwear. Social psychological models could be applied to investigate relationship between human’s behaviour and beliefs. One way for investigating human behaviour decision making is through the Theory of Planned Behaviour (TPB) (Ajzen, 1991), which is one of the most widely cited and applied social psychological models of health and safety related behaviour (Morris et al., 2012); the theory has been successfully applied to the prediction of a wide range of health-related behaviours and a number of studies have supported the validity of the TPB (Armitte and Conner, 2001; Ajzen, 2014); According to the TPB, human behaviour is guided by three types of considerations: behavioural beliefs that produce a favourable or
unfavourable attitude, normative beliefs that result in perceived social pressure or subjective norms, and control beliefs that give rise to perceived behavioural control. Attitudes toward behaviours, subjective norms, and perceptions of behavioural control lead to the formation of behavioural intention and a person’s intention to behave in a particular manner is the prediction of actual behaviour (see Figure 1). The more favourable the attitude and subjective norm, and the greater the perceived control, the stronger should be the person’s intention to perform the behaviour.

2.2 Questionnaire construction
A survey with 15 house construction project managers, who were in charge of the 15 construction projects, was carried out in order to identify why construction companies seldom provide free footwear. All of the participants are males and each of them has more than 10 years’ work experience in construction industry. No more detailed information about 15 participants was presented in the paper as most of them were reluctant to disclose more personal information. Before the questionnaire survey, all the participants were informed of the purpose of the study; they participated in the survey voluntarily; they were ensured that their answers would remain anonymous and that the data would only be used for scientific purposes.

“Providing free safety footwear to the workers” was defined as the behaviour to be investigated and “15 construction project managers participated in the survey” was specified as the research population. Before constructing the formal questionnaire, the authors had verbal communication with project managers about the usage of safety footwear. The conversation was done in a free style in order to elicit the salient factors to the behaviour. Then based on the information obtained from labour workers and project managers, six questions, correspondingly focusing on attitude, subjective norm and perceived behavioural control, were included in the final questionnaire. The participants were asked to respond on a three-point Likert scale scored as -1, 0 and +1. A positive response to behaviour of “Providing free safety footwear” was scored +1, the negative response was scored -1, and the other response was scored 0.

2.3 Results and Discussions
Behavioural belief consider about the likely consequence of the behaviour which produce a favourable or unfavourable attitude toward the behaviour (Ajzen, 1991). For the behavioural beliefs, two items including one positive belief and one negative belief were investigated. For “Q1. Do you think that providing free safety footwear to the workers is effective in reducing feet injury? ,” 11 participants selected “yes” and no one selected “no”. We can see that more than 73% of participants have realized the importance of safety footwear. Some of those who selected “other” told the authors that workers probably do not wear safety footwear even providing free safety footwear to them and they also said that safety footwear would not be effective if the workers are involved in severe accident. Before the informal survey, the author have asked workers why they don’t wear safety footwear, “I Don’t feel comfort while wearing safety footwear as it is heavy and stiff” is one of the most cited reasons. According to the workers’ response, wearing safety footwear probably slows the work down as uncomfortableness caused by safety footwear. The requirements for effective protection deteriorate safety footwear’s biomechanical hygienic properties (Irzmańska, 2015). So we asked the construction project managers the question “Q2. Do you think wearing safety footwear would slow down the work?” contrary to the workers’ point of view, all of them said “no” to the question.

Normative beliefs are about the normative expectations of others which results in perceived social pressure or subjective norm (Ajzen, 1991). Two referents, including supervisory engineers and Construction administration department of local government, were used to measure the normative belief. In the Chinese construction industry, supervisory engineers, who are employed by project investors and are the interest representatives of investors, oversee the construction process at the construction sites; Construction administration department of local government also oversee and inspect the construction process periodically. Theoretically, these two parties should take actions if the construction company violates the national rules or regulations of the construction industry. So the
questions 3 and 4 were raised. For “Q3. Does the supervisory engineer take action on the violation of usage of safety footwear?” all of the participants answered “no” and for “Q4. Does construction administration department of local governments take action on the violation of usage of safety footwear?” we got 9 “no”, 6 “other” and 0 “yes”.

Perceived behaviour control is about factors that may facilitate or impede performance of behaviour (Ajzen, 1991). For perceived behavioural control, two control beliefs were used. For “Q5. Is it a heavy financial burden to provide free safety footwear to every labour worker?” 14 participants answered “no” and only one participant answered “other”. In China, the price of safety footwear is approximately 120 RMB (about 20 USD), most of the project managers admitted that it was not heavy financial burden if providing free safety footwear to every worker. Occupational injuries within the construction industry always associate with considerable financial costs. Investment into PPE to prevent injuries is worthy of the cost from the point of cost-benefit analysis. During the conversation with the project managers, they mentioned that normally there is not long-term employment contract between company and workers and high job mobility exists among migrating peasant workers; the safety footwear is not reusable by different persons, so the “Q6. Does the high employment mobility of migrating peasant workers impede providing free safety footwear?” was included in the survey form and 7 “no”, 6 “other” and 2 “yes” were obtained.

3. Conclusion
Migrating peasant worker is a special social group in China, because of lacking of receiving a good education and skills, most of them engage in the labour works in the cities. According to the data released by the National Bureau of Statistics of the PRC, there were 61.1 million migrating peasant workers in the construction industry, one of most hazardous industries, in the year of 2014; the fundamental rights, such as public healthcare, unemployment benefits and labour protection, cannot be guaranteed. The Ministry of Construction of PRC released the “Provisions on the Administration of Use of Personal Protection Equipment for Construction Practitioners” in 2007. It is stressed that PPE, including safety footwear, must be provided to practitioners without any charge by the construction company. However, the enforcement of the corresponding administration regulation about safety footwear is not guaranteed.

This paper reports a work to identify the why employers seldom provide free safety footwear in Chinese construction industry. Questionnaire survey based on the Theory of Planned Behaviour is applied as the research technique and six items corresponding to participants’ attitude, subjective norm and perceived behavioural control were included in the survey form. Investigation was carried out among 15 construction project managers who were in charge of 15 construction projects. It was found that subjective norm to the behaviour is the effective intervention measure, which is urgently needed to be improved and there is plenty of room for this potential change.

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