



Review Article

The Influence of Religiosity on Safety Behavior of Workers: A Proposed Framework

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ABSTRACT

There has been a growing body of studies on religion and human safety behaviour in recent years. However, psychologists seem to be more inclined to pairing religiosity and non-occupational risky behaviour (such as smoking, substance abuse, drinking and driving) in their studies, while safety scientists have hardly explored the influence of religiosity on occupational safety behaviour such as taking shortcuts or breaking the rules. To close this gap, this paper suggests that empirical studies should be conducted to explore possible associations between religiosity and safety behaviour at the workplace. To facilitate such studies, a conceptual framework is proposed based on the Theory of Planned Behaviour (TPB). This paper explains the rationale of choosing TPB. While TPB postulates that both the behavioural intention and perceived behavioural control explain the behaviour, it is interesting to examine the effect of religiosity on occupational behaviour. Examining religiosity as a new construct in occupational safety behaviour studies can help trigger the interest of other religious scholars, psychologists and safety scientists to use religiosity as a construct more rigorously in their future studies on safety to address the gap. Such studies can also help formulate or enhance safety interventions, since these human-related incidents and accidents seem endemic in high-risk industries.

Keywords: Occupational safety behaviour, religiosity, Theory of Planned Behaviour (TPB)

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INTRODUCTION

In any high-risk industry, safety is of paramount importance. After the Piper

Alpha incident in 1988 where 167 offshore workers died, researchers conducted many studies to understand the causes of industrial accidents. Reason (1999) reported that the Institute of Nuclear Power Operations in the United States of America found that accidents were contributed by human performance (52%) and design deficiencies (33%). As designs are being constantly improved and deficiencies supplemented using highly sophisticated and safety-based technology, most of the design concerns are now coming under control. However, accidents or disasters continue to happen, although the most modern technology is used. So, if technology cannot reduce accidents, then what can? This question has been plaguing safety scientists for decades, triggering voluminous studies on workplace safety. This has led to studies on the behaviour of workers and the underpinning factors that might contribute to incidents and accidents. Heinrich claimed that 88% of workplace accidents were the result of unsafe behaviour (Manuele, 2011). While this high percentage has been fiercely contested by some scholars, the human factor in accidents at the workplace is still a concern.

ACCIDENT CAUSATION THEORIES

Even though the high percentage of human (unsafe behaviour) contribution to accidents can be disputed, it is Heinrich's studies on the "human factor" that has resulted in the first scientific approach to accident prevention. There are many

accident causation theories or models developed by safety experts to examine factors that contribute to accidents. Some focus on employees' actions (behaviour) or inaction that causes accidents. Others concentrate on the responsibilities (actions and inaction) of the management that contribute to accidents. It is crucial for safety professionals to understand these accident causation theories so that accurate information about organisational safety problems can be used to develop effective safety interventions or programmes to prevent or reduce accidents in the workplace. This paper briefly examines some of the most popular accident causation theories that focus on safety behaviour.

Heinrich's Domino Theory

This domino theory developed by Heinrich in the late 1920s is considered the first accident causation theory ever formulated (Friend & Kohn, 2005). Heinrich's Domino Theory outlines five factors about accidents that are represented by individual principles or 'dominoes':

1. Negative character traits leading a person to behave in an unsafe manner can be inherited or acquired as a result of the social environment.
2. Negative character traits are why individuals behave in an unsafe manner and why hazardous conditions exist.
3. Unsafe acts committed by individuals and mechanical or physical hazards are the direct cause of accidents.

4. Falls and the impact of moving objects typically cause accidents resulting in injury.
5. Typical injuries resulting from accidents include lacerations and fractures.

The five factors can be pictured as a series of dominoes standing on one edge; when one falls, the disturbance causes the next piece to fall, and that causes the next to fall, thus triggering a chain reaction that ends with every piece having fallen. Since each factor is dependent on the preceding factor, when one factor, such as employees' unsafe behaviour or unsafe conditions in the workplace are averted, then the chain reaction is stopped, thus preventing accidents and injuries (Friend & Kohn, 2005).

Bird and Loftus' Domino Theory

Bird and Loftus (1976) developed an updated domino theory that includes the between workers and the management. This theory uses five dominoes to represent the five events that are associated in accidents:

1. Lack of management control – This refers to the functions of a manager such as planning, organising, leading and controlling.
2. Basic cause – This refers to two groups:
 - a. Personal factors such as lack of knowledge or skill, improper motivation, and/or physical or mental problems, and
 - b. Job factors such as inadequate work standards, inadequate design

or maintenance, normal tool or equipment wear and tear, and/or abnormal tool usage.

3. Immediate causes – This refers to unsafe acts and unsafe conditions.
4. Incident or undesired event
5. People-Property-Loss – This refers to the adverse results of accidents such as property damage and human injury. Like Heinrich's theory, the Bird and Loftus Domino Theory also postulates that accidents are preventable if unsafe behaviour is prevented and unsafe conditions are averted.

Human Factors Theory

The Human Factors Theory postulates that accidents are caused by human error, which is the result of three factors:

- 1) Overload, which represents excessive burdens or responsibilities placed on a worker,
- 2) Inappropriate activities, which refer to activities that are new or unfamiliar to the worker, and
- 3) Inappropriate response, which occurs when a worker does not take corrective action when he sees a hazard or when a worker removes a protective system in order to increase productivity (Friend & Kohn, 2005).

Swiss Cheese Model

Unlike Heinrich's Domino Theory, which is considered the traditional approach to accident causation, the Swiss Cheese Model,

developed by Reason (1999), is classified under the modern approach of accident causation. According to this theory, the factors causing accidents can be visualised as slices of cheese, having many holes; however, unlike in cheese, the 'holes' in accidents i.e. the factors causing accidents are continuously shifting their position. The holes represent the faults or failures and their presence in any of the slices does not normally cause accidents. Accidents happen when all the slices of cheese line up to allow a trajectory path for the hazards to pass through so that they come in contact with the victims. The holes (faults) in the slices are caused by two elements, namely active failures and latent conditions. Active failures are the unsafe behaviour of people who are in direct contact with the system of work and are in the form of slips, lapses, fumbles, mistakes and procedural violations (Reason, 1999), while latent conditions refer to the inevitable "resident pathogens" that lie dormant within the system (Reason, 1999). They will lie dormant until some enabling conditions such as error or the unsafe behaviour of workers triggers it (Woods, Johannesen, Cook, & Sarter, 1994).

These accident causation theories emphasise that safety behaviour of workers is one of the major contributors to accidents. Therefore, to reduce accidents at the workplace, the root causes of lack of safety behaviour need to be examined in order to increase safe behaviour and reduce or stop unsafe behaviour. Accident causation theories are central in driving study into safety and human behaviour.

OCCUPATIONAL SAFETY BEHAVIOUR STUDIES

There is a vast body of studies on human error, human behaviour, human attitude and human personality conducted by scientists and psychologists in the attempt to understand the human factors that lead to accidents. For example, Mearns, Flin, Gordon and Flemming (1997) studied the organisational and human factors that affected safety in onshore and offshore installations. A few years later, a study was conducted to examine the impact of safety climate on safety behaviour of workers in organisations (Neal, Griffin, & Hart, 2000). Other studies on safety behaviour in the literature included safe lifting behaviour by Johnson and Hall (2005); safety climate prediction of unsafe behaviour by Fogarty and Shaw (2010); safety behaviour in petrochemical plants by Salleh (2010), and; safety motivation impact on safety behaviour by Ibrahim (2012).

Despite the volume of safety behaviour studies in the literature, not all the issues raised by these studies have been settled. For example, Cooper and Phillips (2004) claimed that researchers struggled over the last 25 years searching for empirical evidence on safety climate and safety performance relationship. In addition, Salleh (2010) suggested that while the study of human safety behaviour has been conducted for decades, the solutions remained "scattered and scarce". In addressing these issues, Cooper and Phillips (2004) proposed that many more studies are needed, and they should use a range

of safety performance outcome variables instead of depending mainly on self-report instruments. Thus, to look into and further understand the complexities of safety behaviour, it is proposed that more safety behaviour studies should be conducted from various perspectives such as religion. For example, in a study on Christianity, Islam and Traditional African Religion groups in Ghana, Gyekye and Haybatollahi (2012) measured the influence of religion on safety behaviour of the workers in the workplace. They found that Christian workers indulged in safer behaviour than their colleagues from the Islamic and the traditional African religious groups. The Muslim and Traditionalist workers were also found to be more fatalistic in their attitudes than the Christian workers.

Accidents or disasters continue to happen in many advanced countries such as The United States of America and the United Kingdom in spite of the latest technology and sophisticated systems used in their high-risk industries such as oil and gas, nuclear and construction. The use of sophisticated engineering is no guarantee that accidents will be averted. This finding is consistent with that of most studies in the literature that human factors contribute more to the occurrence of accidents in the workplace than do technological factors. For example, the Institute of Nuclear Power Operations (INPO) in the United States of America found that 52% of the significant events reported in 1983 and 1984 were caused by human performance (Reason, 1999). This 52% of human contribution

to accidents in the workplace was broken down further into deficient procedures or documentation (43%); lack of knowledge or training (18%); failure to follow procedures (16%); deficient planning or scheduling (10%); miscommunication (6%); deficient supervision (3%); policy problems (2%) and others (2%). The data indicated that most root causes came from either maintenance activities or bad decisions taken by the management.

RELIGIOSITY STUDIES

As seen in Section 3, there is an abundance of safety behaviour studies exploring factors affecting safety behaviour. However, religiosity is hardly studied in the realm of safety or safety behaviour. Research into religiosity and behaviour is considered “worthwhile” (Creel, 2007) as many people worldwide are pervasively engaged in the practice of religion. For example, in a survey by The Religion Monitor, Pickel (2013) found the percentage of people who claimed to be “very,” “fairly” or “moderately” religious is considerably high: Turkey (82%), Brazil (74%), India (70%) and the USA (67%).

Mokhlis (2006) defined religiosity (also called religious commitment) as “the degree to which beliefs in specific religious values and ideals are espoused and practiced by an individual” (p. ii). On the other hand, the World Health Organisation (WHO) (1998), firstly defined religion as “belief in the existence of a supernatural ruling power, the creator and controller of the universe, who has given to man a spiritual nature

which continues to exist after the death of the body” (p. 7). However, WHO (1998) did not define religiosity but religiousness instead; religiousness refers to the extent to which an individual believes in, follows and practises a religion.

There is a plethora of studies in the literature that support the growing body of studies on religion or religiosity and human behaviour. Some aspects of human behaviour widely studied by psychologists and researchers in relation to religion and religiosity are health behaviour (Creel, 2007; Kutcher, Bragger, Srednicki, & Masco, 2010; Dodor, 2012), consumer behaviour (Mokhlis, 2006; Lau, Choe, & Tan, 2011), business ethical and unethical behaviour (Ademir & Egilmez, 2010), sexual risk behaviour (Campbell, 2008; Haglund & Fehring, 2009), prosocial behaviour (compliant, public, anonymous, dire, emotional and altruistic) (Hardy & Carlo, 2005), HIV risky behaviour (Trinitapoli & Regnerus, 2006; Sanchez, 2012) and risk behaviour such as smoking, drinking, speeding and seat-belt use (Cazzell, 2009; Sinha, Cnaan, & Gelles, 2007).

Although many studies found that religiosity can predict risky behaviour in non-occupational settings such as drinking, driving and substance abuse, presently there is hardly any research into religiosity and occupational safety behaviour. For example, in an initial review of 27 behaviour-religiosity studies to date, only one by Khan (2007) actually involved religiosity and safety behaviour in the workplace. It is this gap in knowledge that inspired this

study, which proposes a framework that could be used to fill the gap while at the same time giving a better understanding of how religiosity among workers affects their behaviour with regards to safety in the workplace.

According to Khan (2007), there have been no studies that examined the influence of religiosity on risk factors associated with workplace safety. However, many studies looked at the influence of religiosity on general risk (Chapman & Denholm, 2001; Miller, 2000). Since there is a link between religiosity and risk in general, it is logical to assume that religiosity might also influence safety behaviour in the workplace. Due to this gap in religiosity and safety behaviour knowledge, Khan (2007) conducted a study on the influence of religiosity on workers' safety perception and safety behaviour.

BEHAVIOURAL CHANGE MODELS

As explained in Section 2, accident causation theories are developed to help safety scholars understand factors that contribute to accidents. One factor that is mentioned consistently in those studies is the unsafe act. In order to stop or change any unsafe acts or behaviour, the factors contributing to unsafe acts need to be understood first. Safety scholars have in fact found many useful behavioural theories developed by behaviour psychologists to help investigate factors affecting safety behaviour.

For decades, theoretical models of behavioural change, such as Health Belief Model (HBM), Social Cognitive Theory (SCT), Theory of Reasoned Action (TRA),

Theory of Planned Behavior (TPB) and Transtheoretical model (TTM) have been applied in a wide range of behaviour studies. This paper briefly reviews four of the major theories of behaviour or/and behavioural change that may be relevant to the development of effective intervention in health and safety behaviour from mainstream psychology. Based on evidence from the literature, the most appropriate model was selected for this study.

Health Belief Model (HBM)

The Health Belief Model (HBM), developed by Hochbaum in the 1950s, marked the start of structured and theory-based studies in health behaviour (Creel, 2007). The HBM proposes that people will perform preventive behaviour if they perceive a threat to their health. Such preventive behaviour depends on various factors such as: perceived susceptibility, perceived severity, perceived benefits, perceived barriers and cues to action (Rutter & Quine, 2002). For better understanding of health behaviour, Rosenstock, Strecher and Becker (1988) suggested that an expanded Health Belief Model, which includes perceived self-efficacy, be used in related research as an additional variable.

Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) states that a person's intention to perform a behaviour is the best predictor of behaviour (Ajzen, 1991). Two factors, attitude towards

behaviour and subjective norm, in turn predict the intention to perform (or not to perform) the behaviour. Attitude is defined as a product of belief about consequences and evaluation of the importance of consequences, while subjective norm is defined as the person's normative beliefs about perceived social pressure from significant others (Rutter & Quine, 2002).

Theory of Planned Behaviour (TPB)

One major drawback of TRA is that its predictive power is poor when dealing with people who perceive that they have little control over their behaviour or attitude. Due to this drawback, Ajzen (1991) added a construct to the Theory of Reasoned Action (TRA) and called it the Theory of Planned Behaviour (TPB). This construct is termed as perceived behavioural control, which represents the perception of people on the ease or difficulty of performing the behaviour (Gielen & Sleet, 2003). In brief, the Theory of Planned Behaviour (TPB) proposes that a combination of attitude, subjective norm and behavioural intention could predict one's behaviour.

Transtheoretical model (TTM)

The outcomes of the three models discussed so far i.e. the Health Belief Model (HBM), the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB), can all be considered as lying on a continuum (Rutter & Quine, 2002). In these models, to change a person's behaviour up or down the

continuum, an act of intervention to change the person's belief about the particular behaviour is required. Meanwhile, in the Transtheoretical model (TTM), the outcome can be categorised into five stages (Rutter & Quine, 2002) as proposed in this model:

- 1) Pre-contemplative – Not thinking to change
- 2) Contemplative – Aware and thinking to change
- 3) Preparation – Preparing to make a change
- 4) Action – Making the change and maintaining it for a short period
- 5) Maintenance – Maintaining the change in behaviour (Gielen & Sleet, 2003).

Taylor, Bury, Campling, Carter, Garfield, Newbould and Rennie (2006) claimed that TTM is considered a popular health behaviour change model, despite the complexities of its structure.

There are a plethora of findings on the features and applications of each of the above four models. For instance, Creel (2007) found that many of the behaviour models and constructs overlap each other and that their predictive powers vary widely, while Taylor et al. (2006) found that each model had its own unique characteristics. For example, the HBM's "perceived threat" construct is different from that of TRA, TPB and TTM (Taylor et al., 2006). In another finding, Ajzen (1998) concluded that the HBM is mostly confined to health behaviour investigation, while the application of TRA and TPB are mostly for general behaviour.

These findings form the basis of selecting the most appropriate model for this study; this is discussed next.

SELECTING THE MODEL FOR THIS STUDY, THE THEORY OF PLANNED BEHAVIOUR (TPB)

Overall, all the previously reviewed health and safety models are capable of explaining the factors affecting a wide range of human behaviour. However, of the four models examined, the Theory of Planned Behaviour (TPB) is considered the most pertinent in building a religiosity-safety behaviour conceptual framework for this study. The preference of the Theory of Planned Behaviour (TPB) over other models is due to a number of reasons. First, the Theory of Planned Behaviour (TPB) is a popular and influential model. For instance, in a meta-analysis of Internet-based intervention, Webb, Joseph, Yardley and Michie (2010) found that the three most commonly used theories were the Social Cognitive Theory (SCT), the Trans-Theoretical Model (TTM) and the Theory of Reasoned Action/Planned Behaviour (TRA/TPB). Apparently, Webb et al. (2010) found that, of the three theories, the Theory of Planned Behaviour (TPB) was the most influential. In another study, Rivas and Sheeran (2003) also suggested that TPB was the most influential model for explaining social and health behaviour.

Second, the Theory of Planned Behaviour (TPB) has greater predictive strength than most of the other behavioural change models. For instance, Taylor et al. (2006) concluded in a meta-analysis that

the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) had superior predictive power compared to the HBM.

Third, the Theory of Planned Behaviour (TPB) is a widely accepted tool in many occupational safety behaviour (safe behaviour and unsafe behaviour) studies, indicating a consensus of TPB utility. For example, in a safe-lifting behaviour study, Johnson and Hall (2005) analysed the results of the study using structural equation modelling and found that the Theory of Planned Behaviour was capable of predicting safe-lifting behaviour. They further proposed that the Theory of Planned Behaviour was also applicable in understanding other safety-related behaviour. In another study that used the Theory of Planned Behaviour as the basis of its framework, Salleh (2010) showed that safety commitment, safety motivation, employees' conscientiousness and employees' competency positively predicted safety behaviour. The viability of TPB as a supportive framework for a safety behaviour study has been illustrated further by a study which posited that safety motivation, safety training and safety climate are positively and significantly related to safety behaviour (Ibrahim, 2012).

Fourth, the religiosity construct of this study is more suited to the Theory of Planned Behaviour (TPB). It was found that religiosity has potential influence on intention and behaviour. While there are countless studies employing the Theory of Planned Behaviour (TPB) in various behaviour domains as depicted above,

there are not many TPB-based studies that involve the religiosity variable. In one study involving religiosity, Ajzen and Klobas (2013) found that TPB was capable of explaining factors that could influence the decision to have a child. However, the study tested religiosity as one of the many background factors such as nationality, general life values, attitude to childlessness and personality characteristics as well as demographic variables such as age, parity, housing conditions, income and education. Despite the background role played by this religiosity construct, this study conducted by Ajzen and Klobas (2013) serves as an empirical support for the utility of a behaviour-and-religiosity conceptual framework.

In contrast to the role of religiosity in the above study, Alam (2012) proved in his study on 300 Muslim consumers in Malaysia that religiosity could also be used as one of the main variables in TPB application. In his study, Alam (2012) found that religiosity had a significant and positive influence on the intention to buy a house using the Islamic financing method. Therefore, based on this finding, it is proposed in this study that religiosity plays a role in behavioural safety intention. This proposition led to the formulation of the religiosity and safety behaviour conceptual framework based on TPB.

THE THEORY OF PLANNED BEHAVIOUR (TPB)

The Theory of Planned Behaviour (TPB) was introduced by Ajzen in 1985 and is

now one of the most popular models used in predicting human social behaviour. Ajzen (2011) claimed that using the Google Scholar search engine, it had been found that the number of citations of this work had increased from 22 in 1985 to 4550 in 2010. The Theory of Reasoned Action was the earlier model developed by Fishbein and Ajzen as an intention theory in determining volitional behaviour. Due to its limitation, Ajzen (1991) included a perceived behaviour

control to explain the internal and external constraints on behaviour, and called it the Theory of Planned Behaviour (TPB). The main components of TPB are attitudes, subjective norms, perceived behavioural control, intentions and behaviour (Ajzen, 1991, 2011). The main principle of TPB is that an individual's behaviour is a direct function of behaviour intention and perceived behavioural control. The main constructs are shown in Figure 1.

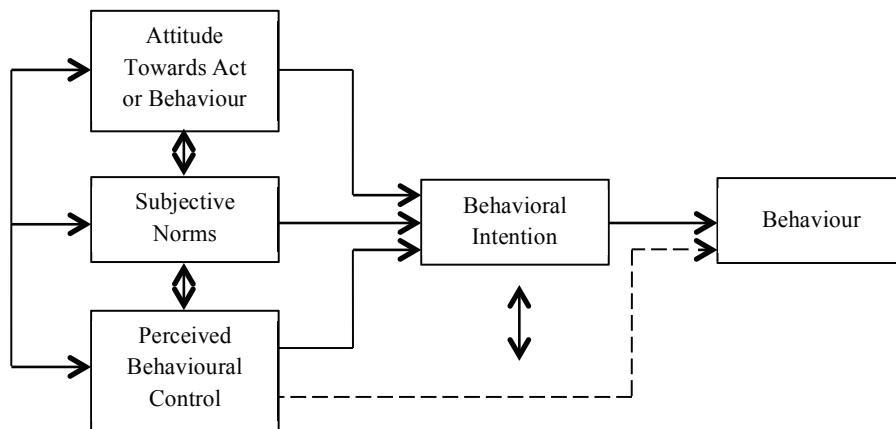


Figure 1. Theory of planned behaviour (Ajzen, 1991)

Attitude

Ajzen (1991) defined attitude as the degree to which a person has a favourable or unfavourable evaluation of behaviour. According to TPB, attitude denotes the positive or negative assessments of behaviour and its consequences. For example, people would tend to develop favourable attitudes towards behaviour that they believe would bring favourable consequences, while forming unfavourable attitudes towards behaviour that they feel

would produce negative outcomes (Ajzen, 1991). According to Fazio (2007), attitude can form from emotional reactions to an object, past behaviour and experiences with the object, or some combination of these sources. The expectancy-value model of attitudes suggests that attitudes develop from the beliefs that people hold about the object of the attitude. These beliefs that are expected to influence attitudes towards the behaviour are called behavioural beliefs (Ajzen, 1991).

Subjective Norms

According to TPB, subjective norms refers to the perceived social pressure to perform or not to perform the behaviour. This social predictor relates to how people important to the person view the behaviour. For example, the disapproval or approval of certain behaviour by family members, friends or co-workers may lead to perceived social pressure to perform or not to perform the behaviour (Ajzen & Fishbein, 2005). Subjective norms can be measured by asking respondents to rate the extent to which important others would approve or disapprove of their performing a given behaviour.

Perceived Behaviour Control

Perceived behaviour control is the third determinant of intention and it refers to the perceived ease or difficulty of executing a certain behaviour. Perceived behavioural control is considered a central factor in TPB. It differentiates TPB from the Theory of Reasoned Action (TRA). Generally, the greater the three determinants, the attitude, the subjective norm and the perceived behavioral control, the stronger the intention to execute the behaviour. However, the importance of attitude, subjective norm and perceived behavioral control may vary across different behaviours. In one situation, perceived behavioural control and intention can effectively predict behaviour. However, in another situation, it is not surprising if only one of them is required to predict behaviour (Ajzen, 1991).

Behavioural Intention

Intention is instrumental in influencing behaviour in both TRA and TPB. Intention reflects the degree of seriousness and willingness of a person to carry out a certain behaviour. The stronger the intention to execute behaviour, the more likely that the behaviour is going to be executed. According to the TPB, behaviour to be performed depends not only on the motivation or intention to perform it but also to a certain degree on non-motivational elements such as time, money and skill (Ajzen, 1991). For example, a person's intention to purchase a sports car would not turn into purchasing behaviour if the cost of the car were beyond his or her financial capability. The cost of the car would be the controlling factor, while the decision to buy or not to buy would be the motivational factor. If the person had enough money or resources and had the intention of buying the sports car, then he or she would succeed in purchasing it.

Behaviour

TPB provides a useful conceptual framework for understanding the diversities and complexities of human social behaviour. According to TPB, performance of a certain behaviour is dependent on intention and perceived behavioural control. For accurate prediction of behaviour, both intention and perceived behavioural control must be related to that behaviour. For example, if we measured the 'intention to donate' or 'intention to help the Red Cross' to predict the behaviour of 'donating money to the

Red Cross', then the prediction would not be accurate. The correct measure would be 'intention to donate to the Red Cross' as it reflects the desired behaviour. Similarly, perceived behavioural control must be specific to the behaviour to be predicted (Ajzen, 1991).

STRENGTHS AND LIMITATIONS OF THE THEORY OF PLANNED BEHAVIOUR (TPB)

The main strength of the TPB is that it can explain non-volitional (non-voluntary) behaviour, which cannot be explained by the Theory of Reasoned Action (TRA). To explain behaviour, be it voluntary or non-voluntary behaviour, a concept of perceived ease or difficulty of executing the behaviour is added (Ajzen, 1991). This concept is known as perceived behavioural control. In voluntary behaviour, behavioural intention can reflect the behaviour, whereas in non-voluntary behaviour, perceived behavioural control is considered a stronger factor than intention in predicting the behaviour (Ajzen, 1991). The perceived behavioural control is likened to a concept proposed by Bandura (1982) called perceived self-efficacy which "is concerned with judgments of how well one can execute courses of action required to deal with prospective situations" (p. 122).

Another strong point of TPB is that it has greater predictive strength than most other behavioural change models (Taylor

et al., 2006). Further, it was noted that among the 12 health-related behaviour models examined, TPB was the only one that was validated and had variables which covered behaviour motivation, intention and enacting (Armitage & Arden, 2002; Hrubes et al., 2001; Armitage & Conner, 2001).

Nonetheless, the TPB is not without issues or limitation. For example, Bandura (1992) argued that self-efficacy does not equate to perceived behavioural control concept, which Ajzen (1991) claimed are both compatible constructs. However, McCaul et al. (1993) showed that self-efficacy does not contribute much to the effectiveness of TPB, which actually resolved the concern. Johnson and Hall (2005) reported that some studies had encountered problems when measuring beliefs related to TPB, but the problems were addressed by excluding them from the studies. Despite the few limitations mentioned, TPB remains popular with researchers.

PROPOSED FRAMEWORK: THE EXTENDED THEORY OF PLANNED BEHAVIOUR (TPB)

The proposed framework consisting of five TPB constructs and one additional religiosity construct are discussed below. The diagram of the extended TPB model for the religiosity-occupational safety behaviour framework is shown in Figure 2.

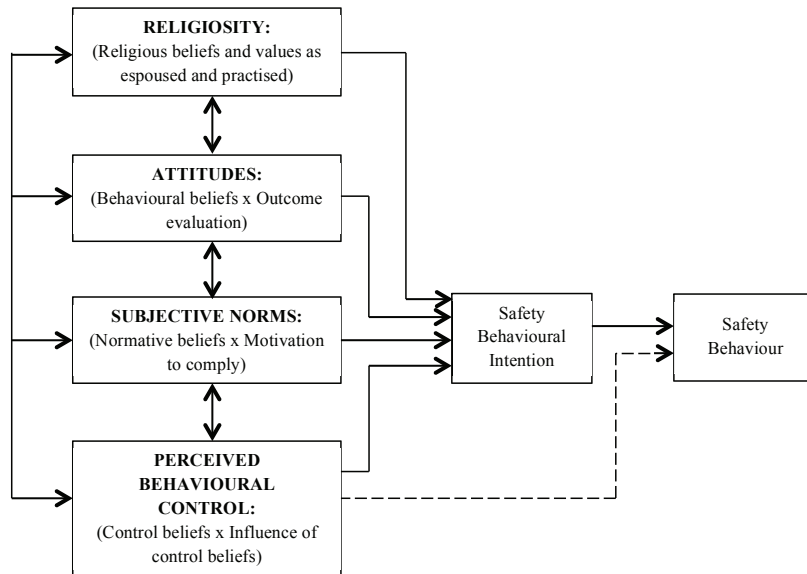


Figure 2. The extended theory of planned behaviour

Safety Attitude

Safety attitude simply refers to the beliefs or perceptions concerning the policies, procedures and practices of safety (Neal & Griffin, 2004). For example: “I intend to encourage fellow workers to work safely next week,” is a typical item to measure safety attitude. Based on TPB, safety attitude is the first determinant of the safety intention of a worker to perform safe behaviour. Generally, behavioural belief about certain attributes of an object combines multiplicatively with the evaluation of the attributes such as the cost incurred in executing safety behaviour to strengthen safety attitude (Ajzen, 1991).

Subjective Norms

‘Subjective norms refer to the overall perceived social pressure derived from the

combined normative beliefs (beliefs that others want someone to hold in order to execute a certain behaviour) of various social referents (Ajzen, 2012). The perception of the normal group safety practices in a given workplace is an example of a subjective norm (Fogarty & Shaw, 2010). A typical item such as “Most people who are important to me support me in working safely,” is used to measure the subjective norms for safety behaviour prediction. Subjective norms depend on normative beliefs, which refer to the likelihood that important individuals or groups approve or disapprove of performing a certain behaviour and the person’s motivation to comply with the referent. However, Armitage and Conner (2001) showed that subjective norms as a whole is a weak predictor of behavioural intention.

Perceived Behaviour Control

According to Fogarty and Shaw (2010), perceived behavioral control refers to the inability to perform work according to rules and procedures because of forces that are beyond the individual's control. Fogarty and Shaw (2010) suggested that workplace pressures could be considered an example of perceived behaviour control in the workplace context. Items such as "I am confident that I would follow safety procedures during the presence of my supervisor," typifies a perceived behaviour control measure. To obtain the perceived behaviour control, control belief is multiplied by perceived power of the control factor to facilitate or inhibit performance of the behaviour. Control belief may refer to past experience with the behaviour or factors that increase or reduce the perceived difficulty of performing the safety behaviour.

Behavioural Intention

As posited by TPB, behavioural intention is central to performing behaviour. Intention is defined in TPB by Ajzen (1991) as the amount of effort one is willing to exert to attain a goal. Therefore, safety intention refers to a person's plan or intention to perform safe behaviour. For example, the item, "I intend to encourage fellow workers to work safely next week," is used to gauge the worker's safety intention.

Safety Behaviour

Occupational safety behaviour is defined as behaviour required to promote safety at the workplace and behaviour that does not affect the worker's safety directly but helps to build conditions that promote safety (Neil & Griffin, 2006). For example, the item, "I don't take chances in getting a job done," exemplify the safety behaviour measurement. As posited by TPB, the execution of safety behaviour is dependent on safety intention and perceived behavioural control. However, it is possible that any one of them is capable of predicting safety behaviour (Ajzen, 1991). As discussed earlier, safety behaviour is one of the prevalent factors in accident causation theories. To understand the factors influencing safety behaviour, TPB is frequently used in studies. However, the influence of religiosity on safety behaviour is hardly explored. Thus religiosity as a construct is added to TPB to offer a conceptual framework for safety scholars for collecting more empirical evidence on the safety behaviour and religiosity relationship.

Religiosity

Mokhlis (2006) defined religiosity as "the degree to which beliefs in specific religious values and ideals are espoused and practiced by an individual." Items such as "I offer prayer five times daily," are a religiosity measurement. Religion is the

most significant identity of a person and it governs his behavior and lifestyle. In fact, almost every individual is affiliated to a certain religion and makes decisions based on religious teaching, beliefs or values. Depending on the individual's level of religiosity, his or her attitude and behaviour are normally shaped by this set of beliefs and values (Ghouri et al., 2016). With the incredible number of application of 28 times in 1985 to 4550 in 2010 (Ajzen, 2011), TPB is considered one of the popular theories for studying human behaviour. As religion influences and dictates one's daily thoughts and behaviour, it is only fitting to study religiosity and safety behaviour using TPB.

A few studies proposed an extended model of TPB as their religiosity construct. For example, Ho et al. (2008) found in a religiosity study using TPB that religiosity was positively related to Internet engagement in online religious activities. As noted earlier, Alam (2012) also found that religiosity was significantly and positively related to behavioural intention using a similar extended framework of TPB, with religiosity as an added determinant of intention. The above studies by Ho et al. (2008) and Alam (2012) on Internet surfing behaviour and purchasing behaviour showed consistency in incorporating religiosity as the determinant of behavioural intention in TPB. Therefore, it appears appropriate to propose religiosity as the additional determinant of safety intention to predict safety behaviour in the extended version of TPB. In this proposed framework, religiosity is added as the fourth determinant

of behavioural intention, along with safety attitude, subjective norm and perceived behavioural control.

CONCLUSION AND FUTURE WORK

Given the fact that many proponents of TPB have successfully applied in their studies all the constructs proposed in this study such as religiosity, safety attitude, perceived behaviour control and safety behavioural intention in predicting various testable behaviour on different populations, this paper concludes that TPB is the suitable framework for this study.

The main proposition of this study is that Muslim workers' religiosity will have a positive relationship with occupational safety behaviour. While the researcher plans to apply the proposed conceptual framework in testing the proposition on the safety behaviour of Muslim shipyard workers in Malaysia, other researchers elsewhere are also encouraged to test it on different affiliates.

With an estimated 264 million occupational accidents and 350,000 fatalities occurring yearly around the globe (Hamalainen, Takala, & Saarela, 2006), it is hard to ignore the pressing need to address accidents at the workplace. Apparently, with many countries claiming to be religious such as Turkey (82%), Brazil (74%), India (70%) and the USA (67%), it is hard to ignore the possible influence of religiosity on safety behaviour (Pickel, 2013). In an effort to decrease accidents in the workplace, this paper proposed a religiosity-based framework that could help researchers in

conducting further empirical studies on safety behaviour of the workers. The studies could help researchers to understand human safety behaviour better before intervention can be taken to reduce unsafe behaviour.

Future work involves using this conceptual framework to investigate the safety behaviour of Muslim shipyard workers in Malaysia. In order to investigate Muslim religiosity, an Islamic religiosity scale will be used. Researchers can use the proposed framework on different affiliates with related religiosity scales. It is believed that this framework could enhance the understanding of safety behaviour of different religious affiliations throughout the world.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. Retrieved from <http://www.nottingham.ac.uk/~ntzcl1/literature/tpb/ajzen2.pdf>
- Ajzen, I. (1998). Models of human social behavior and their application to health psychology. *Psychology and Health*, 13(4), 735–739. doi: 10.1080/088704498084074
- Ajzen, I. (2011). The theory of planned behavior: Reactions and reflections. *Psychology and Health*, 26(9), 1113–1127. doi: 10.1080/08870446.2011.613995
- Ajzen, I. (2012). The theory of planned behavior. In P. A. M. Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (vol. 1, pp. 438–459). London, UK: Sage Publications. Retrieved from http://rcgd.isr.umich.edu/seminars/articles/Ajzen_TPB2012.pdf
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *The handbook of attitudes* (pp. 173–221). Mahwah, NJ: Erlbaum.
- Ajzen, I., & Klobas, J. (2013). Fertility intentions: An approach based on the theory of planned behavior. *Demographic Research*, 29(8), 203–232. doi: 10.4054/DemRes.2013.29.8
- Alam, S. S., Janor, H., Zanariah, Che Wel, C. A., & Ahsan, M. N. (2012). Is religiosity an important factor in influencing the intention to undertake Islamic home financing in Klang Valley? *World Applied Sciences Journal*, 19(7), 1030–1041. doi: 10.5829/idosi.wasj.2012.19.07.392
- Armitage, C. J., & Arden, M. A. (2002). Exploring discontinuity patterns in the transtheoretical model: An application of the theory of planned behavior. *British Journal of Health Psychology*, 7(1), 89–103.
- Armitage, C. J., & Conner, M. (2000). Social cognition models and health behavior: A structured review. *Psychology and Health*, 15(2), 173–189.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40(4), 471–499.
- Aydemir, M., & Egilmez, O. (2010). An important antecedent of ethical/unethical behavior: Religiosity. *Eurasian Journal of Business and Economics*, 3(6), 71–84. Retrieved from <http://ejbe.org/EJBE2010Vol03No06p71AYDEMIR-EGILMEZ.pdf>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

- Bandura, A. (1992). On rectifying the comparative anatomy of perceived control: Comments on “cognates of personal control”. *Applied and Preventive Psychology, 1*(2), 121–126.
- Bird, F. E., & Loftus, R. G. (1976). *Loss control management*. Loganville, GA: Institute Press.
- Campbell, H. D. (2008). *An examination of the relationship between spirituality and religion and selected risk-taking behaviors in college undergraduates*. (Doctoral dissertation). Faculty of the Virginia Polytechnic Institute, State University.
- Cazzell, M. (2009). *College student risk behavior: Implications of religiosity and impulsivity*. (Doctoral dissertation). The University of Texas at Arlington.
- Chapman, J. A., & Denholm, C. (2001). Adolescent’s risk activities, risk hierarchies and the influence of religiosity. *Journal of Youth Studies, 4*(3), 279–297.
- Cooper, M. D., & Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research, 35*(5), 497–512. doi:10.1016/j.jsr.2004.08.004
- Creel, D. B. (2007). *Assessing the influence of religion on health behavior*. (Doctoral dissertation). Louisiana State University.
- Dodor, B. (2012). The impact of religiosity on health behaviors and obesity among African Americans. *Journal of Human Behavior in the Social Environment, 22*(4), 451–462. doi:10.1080/10911359.2012.664977
- Fazio, R. H. (2007). Attitudes as object-evaluation associations of varying strength. *Social Cognition, 25*(5), 603–637.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA, Don Mills, Ontario: Addison-Wesley.
- Fogarty, G. J., & Shaw, A. (2010). Safety climate and the theory of planned behavior: Towards the prediction of unsafe behavior. *Accident Analysis 42*(2010), 1455–1459. doi: 10.1016/j.aap.2009.08.008
- Friend, M. A., & Kohn, J. P. (2005). *Fundamentals of occupational safety and health* (4th Ed.). Lanham, Maryland, U.S.A: The Rowman & Littlefield Publishing Group, Inc.
- Ghouri, A. M., Khan, N. R., & Kareem, O. B. A. (2016). Improving employees’ behavior through extension in theory of planned behavior: A theoretical perspective for SMEs. *International Journal of Business and Management, 11*(11), 196. doi:10.5539/ijbm.v11n11p196
- Gielen, A. C., & Sleet, D. (2003). Application of behavior-change theories and methods to injury prevention. *Epidemiologic Reviews, 25*(1), 65–76. doi: 10.1093/epirev/mxg004
- Gyekye, S. A., & Haybatollahi, M. (2012). Workers’ religious affiliations and organizational behavior: An exploratory study. *International Journal of Organizational Behavior, 17*(4), 1–18. Retrieved from http://www.researchgate.net/publication/233922236_WORKERS_RELIGIOUS_AFFILIATIONS_AND_ORGANIZATIONAL_BEHAVIOR_AN_EXPLORATORY_STUDY
- Haglund, K., & Fehring, R. (2009). The association of religiosity, sexual education, and parental factors with risky sexual behaviors among adolescents and young adults. *Journal of Religion and Health, 49*(4), 460–472. doi: 10.1007/s10943-009-9267-5
- Hamalainen, P., Takala, J., & Saarela, K. L. (2006). Global estimates of occupational accidents. *Safety Science, 44*(2), 137–156. doi:10.1016/j.ssci.2005.08.017

- Hardy, S. A., & Carlo, G. (2005). Religiosity and prosocial behaviors in adolescence: The mediating role of prosocial values. *Journal of Moral Education, 34*(2), 231–249. doi: 10.1080/03057240500127210
- Ho, S. S., Lee, W., & Hameed, S. S. (2008). Muslim surfers on the internet: Using the theory of planned behavior to examine the factors influencing engagement in online religious activities. *New Media Society, 10*(1), 93–113. doi: 10.1177/1461444807085323
- Hrubes, D., Ajzen, I., & Daigle, J. (2001). Predicting hunting intentions and behavior: An application of the theory of planned behavior. *Leisure Sciences, 23*(3), 165–178.
- Ibrahim, M. Z. (2012). *A case study of safety behavior in the construction site*. (Master's Dissertation). Universiti Utara Malaysia, Malaysia. Retrieved from http://etd.uum.edu.my/3027/3/Mohd_Zakir_Ibrahim.pdf
- Johnson, S. E., & Hall, A. (2005). The prediction of safe lifting behavior: An application of the theory of planned behavior. *Journal of Safety Research, 36*(1), 63–73. doi: 10.1016/j.jsr.2004.12.004
- Khan, F. S. (2007). *Understanding the impact of work-related cultural values and religiosity on work-related safety perceptions and behavior*. (PhD Dissertation). University of Wisconsin-Madison.
- Kutcher, E. J., Bragger, J. D., Srednicki, O. R., & Masco, J. L. (2010). The role of religiosity in stress, job attitudes, and organizational citizenship behavior. *Journal of Business Ethics, 95*(2), 319–337. Doi: 10.1007/s10551-009-0362-z.
- Lau, T. C., Choe, K. L., & Tan, L. P. (2011). Ascertaining the roles of money and religiosity in unethical consumer situations. *Australian Journal of Basic and Applied Sciences, 5*(8), 234–239. Retrieved from <http://ajbasweb.com/old/ajbas/2011/August-2011/234-239.pdf>
- Manuele, F. A. (2011). Dislodging two myths from the practice of safety. *Professional Safety, 56*(10), 52–61. Retrieved from <http://www.coshnetwork.org/sites/default/files/Heinrich-Dislodging-1.pdf>
- McCaul, K. D., Sandgren, A. K., O'Neill, H. K., & Hinsz, V. (1993). The value of the theory of planned behavior, perceived control, and self-efficacy expectations for predicting health-protective behaviors. *Basic and Applied Social Psychology, 14*(2), 231–252.
- Mearns, K., Flin, R., Gordon, & R., Flemming, M. (1997). *Human and organizational factors in offshore safety. Report (OTH 543)*. Offshore Safety Division, Suffolk: HSE Books. Retrieved from <http://www.hse.gov.uk/research/othpdf/500-599/oth543.pdf>
- Miller, A. S. (2000). Going to hell in Asia: The relationship between risk and religion in a cross-cultural setting. *Review of Religious Research, 42*(1), 5–18.
- Mokhlis, S. (2006). *The influence of religion on retail patronage behavior in Malaysia*. (Doctoral dissertation). University of Stirling. Retrieved <http://hd1.handle.net/1893/87>
- Neal, A., & Griffin, M. A. (2004). Safety climate and safety at work. In J. Barling, & M. Frone (Eds.), *The psychology of work place safety* (pp. 15–34). Washington, DC: American Psychological Association. doi: 10.1037/10662-002
- Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology, 91*(4), 946–953. doi: 10.1037/0021-9010.91.4.946
- Neal, A. F., Griffin, M. A., & Hart, P. D. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science, 34*(1–3), 99–109. doi:10.1016/S0925-7535(00)00008-4

- Pickel, G. (2013). *Religion monitor – Understanding common ground – An international comparison of religious belief*. Retrieved from http://www.bertelsmann-stiftung.de/cps/rde/xbcr/SID-3D2FC365-3E47E76C/bst_engl/bro.pdf
- Reason, J. (1999). *Human error*. Cambridge, UK: Cambridge University Press. Retrieved from http://www.storre.stir.ac.uk/bitstream/1893/87/1/Mokhlis_PhD.pdf
- Rivis, A., & Sheeran, P. (2003). Descriptive norms as an additional predictor in the theory of planned behavior: A meta-analysis. *Current Psychology*, 22(3), 218–233. Retrieved from <http://link.springer.com/article/10.1007%2Fs12144-003-1018-2#>
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, 15(2), 175–183. doi: 10.1177/109019818801500203
- Rutter, D., & Quine, L. (2002). *Social cognition models and changing health behaviors* (pp. 1–27). Maidenhead: Open University Press. Retrieved from http://www.nsph.gr/Files/FileManager/Psihologia_ygeias/Notes/1h_imera/SCMs.pdf
- Salleh, A. (2010). *Safety behavior in the Malaysian petrochemical industry*. (Doctoral dissertation). Universiti Utara Malaysia, Malaysia. Retrieved from <http://etd.uum.edu.my/id/eprint/2434>
- Sanchez, M. (2012). *Influence of religious coping on the substance use and HIV risk behaviors of recent Latino immigrants*. (Doctoral dissertation). Florida International University.
- Sinha, J. W., Cnaan, R. A., & Gelles, R. W. (2007). Adolescent risk behaviors and religion: Findings from a national study. *Journal of Adolescence*, 30(2), 231–249. Retrieved from <http://dx.doi.org/10.1016/j.adolescence.2006.02.005>.
- Taylor, D., Bury, M., Campling, N., Carter, S., Garfied, S., Newbould, J., & Rennie, T. (2006). *A review of the use of the health belief model (HBM), the theory of reasoned action (TRA), the theory of planned behavior (TPB) and the trans-theoretical model (TTM) to study and predict health related behavior change* (pp. 1-215). London, UK: National Institute for Health and Clinical Excellence.
- Trinitapoli, J., & Regnerus, M. D. (2006). Religion and HIV risk behaviors among married men: Initial results from a study in rural sub-Saharan Africa. *Journal for the Scientific Study of Religion*, 45(4), 505–528. doi: 10.1111/j.1468-5906.2006.00325.x
- Webb, T. L., Joseph, J., Yardley, L., & Michie, S. (2010). Using the internet to promote health behavior change: A systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *Journal of medical Internet research*, 12(1), e4. doi: 10.2196/jmir.1376
- WHO. (1998). WHOQOL and spirituality, religiousness and personal beliefs (SRPB). *Social change and mental health cluster*. World Health Organization. Retrieved from http://whqlibdoc.who.int/hq/1998/who_MSA_MHP_98.2_eng.pdf
- Woods, D. D., Johannesen, L. J., Cook, R. I., & Sarter, N. B. (1994). *Behind human error: Cognitive systems, computers, and hindsight*. Dayton, Ohio: Dayton University Research Institute.

