How nurses who are sensation seekers justify their unsafe behaviors

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**ABSTRACT**

Sensation seeking, risk-taking propensity and openness to experience are known predictors of unsafe behaviors. The aim of this study is to determine if individuals with these characteristics justify their unsafe behaviors by attributing them to external factors such as a lack of organizational support. We explore the interaction between sensation seeking and risk-taking propensity, explain how nurses justify their unsafe work practices, and investigate the effect of openness on directing sensation seekers’ behavior. In this cross-sectional study, 108 nurses completed questionnaires and an objective task measuring risk-taking propensity. Conditional direct effect analysis showed that nurses with sensation-seeking characteristics and high level of risk-taking propensity were likely to perceive external factors as accounting for their unsafe behaviors. Furthermore, sensation seeking re-expressed as openness to experience predicted increased blame externalization. Additionally, nurses with high risk-taking propensity, leading to a focus on rewards and learning experiences, attributed unsafe work practices to external factors.

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1. Introduction

In the workplace, nurses are often exposed to safety-related situations where they must take action, make decisions, or take risks inconsistent with their beliefs. The state of tension that arises when an individual acts inconsistently with their beliefs has been termed “cognitive dissonance” (Festinger, 1957). Nurses may attempt to reduce cognitive dissonance by justifying their unsafe behavior or actions (Aronson, Akert, & Wilson, 2013). Understanding how nurses justify their unsafe behavior or actions may provide information to organizations seeking to create better risk management programs (Nicholson, Soane, Fenton-O’Creevy, & Willman, 2005, p. 157).

Williamson, Feyer, Cairns, and Biancotti defined risk justification (a facet of safety climate) as “the instances when and the reasons why the individual worked unsafely or took risks” (1997, p. 20). Risk justification also assesses the extent of the occurrence of the unsafe behavior and risk taking, and the underlying causes, such as inadequate training, lack of learning opportunities, time restrictions, and a lack of resources within the organization (Williamson, Feyer, Cairns, & Biancotti, 1997). It is likely less cognitively demanding for individuals to justify unsafe behavior by attributing it to support deficiencies because it reduces cognitive dissonance and perceived internal liability. Such justification has been referred to as “external self-justification” (Aronson et al., 2013). Nurses, for example, may behave unsafely in their routine activities, and justify accidents in terms of hospital management failures such as inadequate provision of proper equipment, such as gloves, hand scrubs, or other medical equipment.

Previous studies have explored the influence of personality characteristics on safety behaviors (see Griffin & Neal, 2000); however, we have identified no studies which have investigated how individuals justify taking risks in organizational settings. In relation to safety-related constructs and attitudes, the most studied personality characteristics are sensation seeking, risk-taking propensity, and openness to experiences. These characteristics have been studied in such contexts as accidents, driving behavior, drug consumption, smoking, and sexual activity (see Dahlen & White, 2006; Miller et al., 2004). Based on the findings of previous research, it is argued that these personality characteristics also influence how people justify their unsafe behaviors. This study therefore examines the interaction between sensation seeking, risk-taking propensity, and openness to experience in predicting risk justification (see Fig. 1).

This study considers the difference between sensation seeking and risk-taking propensity. Sensation seeking is defined as a drive for stimulation and a desire to find and explore new experiences that remains relatively stable and unchanged over time (Jackson, 2008, 2011). Risk-taking propensity is defined as “a behavioral tendency to take risks in response to cues for potential reward in spite of some probability for undesirable results” (MacPherson, Magidson, Reynolds, Kahler, & Lejuez, 2010, p. 1401). Earlier studies have shown that sensation seekers do not always take risks, and their behaviors may tend toward functionality or dysfunctionality (Jackson, 2008). Given that sensation seekers do not take risks in every situation, Nicholson et al. (2005) suggested that there are two types of sensation seekers: risk takers and risk bearers.
engage in risky behaviors to fulfill their need for new sensations and experiences, and engage in exploratory behavior. Both studies found that sensation seekers perceive their environment as allowing them to gain new experiences (Weller & Tikir, 2011). Generally, such individuals use distraction, impulsivity, and cognitive inconsistencies to justify unsafe behaviors. However, Britz and colleagues (2000; Nicholson et al., 2005) suggested that risk takers have both sensation seeking and risk-taking propensity characteristics, whereas risk bearers have only sensation seeking characteristics.

Previous studies have also assumed that sensation seeking and risk-taking propensity are measures of risk-taking behavior; however, these characteristics have different effects on behavior (MacPherson et al., 2010). The most well-known difference between sensation seeking and risk-taking propensity is that the latter is more influenced by rewards (Lauriola, Panno, Levin, & Lejuez, 2013), while the former focuses on seeking new experiences for greater stimulation (Jackson, 2008; Zuckerman, 1994). Additionally, while sensation seeking is usually assessed by questionnaires, risk-taking propensity is assessed by computerized measures such as the Balloon Analogue Risk Task (BART). BART is a more stable measure and reflects real-world behaviors more objectively than questionnaire-based measures (White, Lejuez, & de Wit, 2008).

Earlier studies have failed to consider how sensation seekers justify their unsafe behaviors. However, Franken, Gibson, and Rowland (1992, p. 36) suggested that sensation seekers do not perceive their environment as a threat and found that individuals with high levels of sensation seeking were less likely to perceive their actions or behaviors as leading to negative outcomes. Jackson (2008) noted that sensation seekers perceive their environment as allowing them to gain new experiences, and engage in exploratory behavior. Both studies found that individuals with high levels of sensation seeking have a propensity to engage in risky behaviors to fulfill their need for new sensations and experiences (MacPherson et al., 2010; Roth & Liebe, 2011).

In investigating the circumstances in which sensation seekers try to justify their risky behaviors, we also consider risk taking propensity. We use the BART as a way of determining the effect of rewards on sensation seeking in the prediction of risk justification (MacPherson et al., 2010; Nicholson et al., 2005). Exposure to rewards using a risk taking propensity task will likely modify sensation seeking due to the effect of external motivation. When sensation seekers receive rewards for taking risks, we think they will perceive their tendency to take risks as externally motivated and therefore believe that negative outcomes are not due to them but their environment. Thus, in the context of the workplace, sensation seekers with high risk taking propensity, or risk takers, will likely externally justify unsafe behaviors in terms of deficiencies of support from within their organizations; such as a lack of training and learning opportunities, or time restrictions.

Risk bearers (people who do not perceive rewards as a reason for taking risks) do not have high levels of risk-taking propensity (Donohew et al., 2000; Nicholson et al., 2005). Such people are likely able to focus their energy and attention to face difficulties and take risks when necessary so that they can achieve success in the workplace (Nicholson et al., 2005). We argue then that risk bearers will behave more safely as they are less likely to externalize issues. As risk bearers are able to learn from their experiences, they will be aware of when they have made mistakes or when they have been involved in accidents. Accordingly, the current study predicts that risk bearers will not perceive accidents as occurring due to deficiencies in external support from their organization and will not attribute such deficiencies to be the cause of unsafe work practices. The following hypothesis was formulated:

**H1.** Risk-taking propensity positively influences the relationship between sensation seeking and external risk justification, and this relationship is stronger in individuals with high levels of risk-taking propensity.

This study also postulates that openness to experience influences how sensation seekers justify their actions. Openness to experience, which is based on the five-factor model of personality, is characterized as being "curious, broadminded, cultured, and intelligent" (Barrick & Mount, 1991, p. 6) and having a tendency to experience positive learning environments (Clarke & Robertson, 2005). Openness to experience is positively related to sensation seeking (Chamorro-Premuzic & Furnham, 2009) and types of experience seeking represent all facets of openness (Aluja, García, & García, 2003; Costa & McCrae, 1992). However, open people need to have some degree of curiosity and stimulation to find and learn from new experiences (McCrae & Costa, 1997). This study suggests that the need of sensation seekers for varied and complex stimulations and experiences may direct them to be more open to their environment and learning effectively.

Individuals who have high levels of openness to experience have a tendency to maintain their safety, even when taking risks to gain new experiences (Weller & Tikir, 2011). Generally, such individuals use new information and knowledge to improve their behavior (McCrae & Costa, 1997). However, a high level of openness to experience can also negatively influence behavior and lead to "distracting thoughts, troubling impulses, and cognitive inconsistencies" and a motivation to find unfamiliar views (McCrae & Costa, 1997, p. 840). It is suggested that characteristics of openness also influence how individuals justify their unsafe behaviors.

It appears that no previous studies have examined how individuals with high levels of openness to experience justify their behavior. This study postulates that sensation seeking will direct individuals to become more open and that openness to experience leads to a cognitive bias to identify external factors which can be used to justify unsafe actions. We argue that openness to experience leads to greater cognitive capacity to use experiences as explanatory factors for poor behavior. In clinical settings, for example, it is evidenced that people with high score in openness to experience tended to have high internal sensation seeking motivation to find and try new excitement and experience which led them generally to find new types of activity to fulfill their curiosity (Terracciano, Löckenhoff, Crum, Bienvenu, & Costa, 2008). Consequently, in workplace settings, their external orientation will lead them to perceive unsafe behaviors as occurring due to organization deficiencies in support and will not attribute their behaviors to a desire to have positive learning experiences. Accordingly, the following hypothesis was formulated:

**H2.** Openness to experience indirectly influences the relationship between sensation seeking and external risk justification.

As illustrated in Fig. 1, we analyzed the interaction of sensation seeking and risk-taking propensity in predicting risk justification, whereby a high level of risk-taking propensity was expected to increase the likelihood of support deficiencies being used to justify risk. Further, openness to experience was expected to affect the relationship between sensation seeking and risk justification.

**2. Methods**

**2.1. Participants and procedures**

The study involved 108 female nurses (Mage = 28.71, SDage = 6.48) from a private hospital in Indonesia (representing an 87% response rate). All respondents received research information from the hospital...
management two weeks before the data collection schedule began. The respondents then visited a room provided at the hospital for the surveys and the objective task, using 10 computers with software provided and developed using the Inquisit 3 Desktop Edition (2009) by Millisecond Software. All respondents received a small gift bag for their participation.

2.2. Data collection

The sensation-seeking scale was assessed using Jackson’s (2008) Learning Style Profiler. The self-report questionnaire consisted of 15 items with three-answer choices: “true”, “false” and “can’t decide”. Questions included: “I actively look for new experiences” and “I like to do things that are new and different”. A high score on this scale indicated a sensation-seeking tendency. The Learning Styles Profiler has been used in multiple previous studies to assess organizational outcomes and the scales reliabilities (Cronbach alpha) have been reported as being 0.69 or higher (e.g. Jackson, 2009, 2011). Jackson (2011) also mentioned that sensation seeking scale had significant correlations (r ranged from 0.18 to 0.49, p < 0.01) with Dickman’s functional and dysfunctional impulsivity, NEO-IPIP Extraversion, Cloninger, Svardal and Pryzebeck’s novelty seeking, and EPQ Extraversion.

Risk-taking propensity was measured using the BART (Lejuez et al., 2002; White et al., 2008). Participants were asked to pump a virtual balloon by pressing a button. Every time they pressed the button, they received an amount of virtual money, and the balloon expanded by eight pixels, or approximately 0.22 cm all around. They could choose how many times to press the button to inflate the balloon; however, the balloon could explode at any time once it reached a certain point. If the participant decided to stop pressing the button before the balloon exploded, they would receive all money collected thus far. However, if the balloon exploded, the money would be lost. There were 30 balloons in total: 10 balloons of three different types. Each type had different probability levels for when the balloon would explode, from 1/128 down to 1/1 (see Lejuez et al. (2002) for more detailed explanation). Participants were not informed of these probabilities. We analyzed participants’ adjusted average pump score (the mean number of pumps of only those balloons that did not explode), a high score indicating high risk-taking propensity.

We used the 10 item scale of Openness to Experience of the IPIP (Goldberg et al., 2006). A five-point Likert-style scale, ranging from one (strongly disagree) to five (strongly agree) was used for scoring. Items included “am not interested in abstract ideas” and “am full of ideas”. A high score on this scale indicated a high level of openness.

Risk justification was assessed using four items from Williamson et al.’s (1997) study. Respondents were asked to justify whether their unsafe behavior was a result of a lack of training and feedback, a lack of proper safety equipment or time pressures. Each item was categorized according to a five-point scale that ranged from one (strongly disagree) to five (strongly agree). The total score was obtained by adding the items’ scores. High scores suggested a tendency to unsafe working (Williamson et al., 1997, p. 22).

All materials used in this study were translated into Bahasa Indonesia through the use of standard back-translation. A small number of light corrections were also made by authors to improve upon accuracy of meaning and understanding.

2.3. Data analysis

We used the conditional direct effect analysis — mediated moderation (Edwards & Lambert, 2007; Hayes, 2013, p. 335) — to investigate the hypotheses using PROCESS macro IBM SPSS Statistics version 21 (Hayes, 2013). This analysis offers a straightforward approach to analyzing a combination of moderation and mediation models (Edwards & Lambert, 2007). PROCESS provides an estimation of the mediated moderation model using an ordinary least squares or logistic regression-based path analytic framework (Hayes, 2013). Therefore, in respect of our hypothesis and compared to alternative techniques such as path analysis, this approach offers efficient and modern analysis of how sensation seeking can be re-expressed through openness to experience to be functional, and how the effect of rewards in risk-taking propensity influences the relationship between sensation seeking and risk justification.

We centered sensation seeking and risk-taking propensity scores to improve interpretation of the unstandardized regression coefficient of main effect and reduce collinearity (Dawson, 2014, p. 12). We also used the following procedures in Edwards and Lambert (2007) and Preacher, Rucker, and Hayes (2007) to analyze the conditional direct effect analysis: (1) significant effect of sensation seeking on openness to experience; (2) significant effect of openness to experience and risk justification; and (3) significant interaction effect between sensation seeking and risk-taking propensity in predicting risk justification.

3. Results

Table 1 presents the descriptive statistics, scale reliabilities, and correlations for all variables. The results of Cronbach’s alpha reliabilities showed that all self-report questionnaires were satisfactory. The sensation-seeking scale had 15 items (α = 0.72), the openness-to-experience scale had 10 items (α = 0.78), and the risk justification scale had four items (α = 0.75). The results of the correlations indicated that sensation seeking correlated positively to openness to experience (r = 0.44, p < 0.01), yet showed a non-significant correlation of 0.14 (p = ns) to risk justification. Openness to experience also related positively to risk justification (r = 0.32, p < 0.01). All significant correlations remained significant after calculating Bonferroni’s adjustment for six tests of significance (α = 0.008). Moreover, a non-significant correlation was found between risk-taking propensity and all other variables. These results reflected the expected relationship patterns, as elaborated below.

Table 2 presents the standardized regression coefficients of the model. In support of the first hypothesis, the moderation result suggested that the interaction of sensation seeking and risk-taking propensity was significant in predicting risk justification (β = 0.853, SE = 0.284, t = 3.006, p = 0.003), with a 95% confidence interval, excluding zero (LLCI = 0.290, ULCI = 1.415), and an effect size (f^2) of 0.21. This is
considered a medium and meaningful effect (Cohen, 1988). In addition, the conditional direct effect of sensation seeking in predicting risk justification was significant in both higher ($β = 0.844, SE = 0.396, t = 2.130, p = 0.036$) and lower ($β = −0.861, SE = 0.399, t = −2.161, p = 0.033$) levels of risk-taking propensity.

To investigate further the interaction of sensation seeking and risk-taking propensity in predicting risk justification, a simple slope chart was produced (see Fig. 2). This used one standard deviation below the mean (mean $− 1 SD$) and one standard deviation above the mean (mean $+ 1 SD$) levels of risk-taking propensity. The slope showed that high sensation seekers with a high risk-taking tendency worked unsafely if there was no support from their organization. Conversely, lack of support from the organization was not the reason behind the unsafe behaviors of high sensation seekers who did not have a high risk-taking propensity. The results also showed that the size of effect between two standard deviation changes in sensation seeking led to a 0.61 standard deviation change in risk justification for both high and low levels of risk-taking propensity. Therefore, the first hypothesis was supported.

As presented in Table 2, a significant relationship existed between sensation seeking and openness to experience ($β = 0.152, SE = 0.163, t = 106.132, p = 0.000, LLCI = 0.163, ULCI = 2.231$) and between openness to experience and risk justification ($β = 0.251, SE = 0.077, t = 3.277, p = 0.001, LLCI = 0.099, ULCI = 0.403$). Using a bias-corrected bootstrapping analysis, the indirect effect of sensation seeking on risk justification was significantly different from zero ($β = 0.401, SE = 0.152, LLCI = 0.163, ULCI = 0.782$). Further, the result of the Sobel test showed a significant indirect effect ($β = 0.401, SE = 0.148, z = 2.710, p = 0.007$). Therefore, the results suggested that sensation seeking indirectly predicted risk justification through openness to experience, as suggested by the second hypothesis. Thus, it was concluded that openness to experience directed sensation seeking in predicting risk justification when the level of risk-taking justification was taken into account.

### 4. Discussion

This study examined the potential unsafe work practice of sensation seekers in relation to external risk justification. It suggested that nurses with sensation-seeking characteristics and high levels of risk-taking propensity would be more likely to attribute support deficiencies in their workplace as the reason for their unsafe work practices. This study also argued that openness to experience directs individuals to develop a high level of risk justification due to their greater capacity to identify and interpret external features of the environment.

The hypotheses were tested using procedures from the studies of Edwards and Lambert (2007) and Preacher et al. (2007), which demonstrated that:

1. H1 was supported because the interaction between sensation seeking and risk-taking propensity was positively significant in predicting risk justification.
2. H2 was also supported because openness to experience positively influenced the relationship between sensation seeking and risk justification.

This conditional direct effect analysis suggests that nurses who are sensation seekers and who are high in openness to experience or have a risk taking propensity oriented to gaining rewards tend to externally justify unsafe behaviors as a result of organizational support deficiencies. Thus, the interaction of personality characteristics provides a more meaningful interpretation of the relationship between individual differences and organizational outcomes when compared to a measurement of the main effect (e.g., Witt, Burke, Barrick, & Mount, 2002). The results also show that while sensation seeking does not predict risk justification, measuring the interaction between sensation seeking and risk-taking propensity provides meaningful results.

As suggested in H1, we argued that high levels of risk-taking propensity increased the relationship between sensation seeking and external risk justification. The simple slope analysis indicated that sensation seekers have different levels of risk-taking propensity, and that there are sensation seekers who are not responsive to rewards. Therefore, consistent with previous studies, not all sensation seekers have a tendency toward risk-taking behavior in every situation (Donohew et al., 2000). Such individuals may be curious and explore certain situations, but unwilling to take reward oriented risks. This finding is consistent with the suggestion of Jackson (2008) that the curiosity and exploratory characteristics of sensation seeking can be directed toward both functional and dysfunctional outcomes.

Furthermore, despite earlier studies suggesting that the effect of rewards in minimizing unsafe behavior could, to some extent, bring positive results (e.g., Haines, Merrheim, & Roy, 2001; Kurtzman et al., 2011), this study found that rewards were more likely to have negative effects in terms of promoting external justification of risk. In this study, nurses with high levels of sensation seeking and reward oriented risk-taking propensity externally justified their risk-taking behavior as being due to support deficiencies within the organization, such as a lack of training or lack of learning opportunities. We argue that a focus on receiving rewards is associated with external risk justification since rewards are often associated with external motivation. Therefore, to make it effective, implementation of safety incentive should be also supported by good teamwork and collaboration between nurses (Kurtzman et al., 2011). As a result, if mistakes are made, it would be easier for them to blame external factors, such as time pressure or a lack of support to justify their behavior. We think external rewards associated with the development of greater reliance on the environment and greater capacity to blame the environment when things go wrong.

As suggested in H2, in the prediction of risk justification, openness to experience re-expressed sensation seeking in the prediction of external

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**Table 2**

Model coefficients for the conditional direct effect model.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Consequent</th>
<th>O</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>RJ</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td></td>
<td>33.556</td>
<td>.316</td>
<td>106.132</td>
<td>.000</td>
<td>1.809</td>
<td>3.580</td>
<td>.701</td>
<td>.485</td>
</tr>
<tr>
<td>SS</td>
<td></td>
<td>1.601</td>
<td>.318</td>
<td>5.041</td>
<td>.000</td>
<td>−.009</td>
<td>.278</td>
<td>−.031</td>
<td>.975</td>
</tr>
<tr>
<td>O</td>
<td></td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>−.251</td>
<td>.077</td>
<td>3.277</td>
<td>.001</td>
</tr>
<tr>
<td>RT</td>
<td></td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>−.179</td>
<td>.253</td>
<td>0.674</td>
<td>.502</td>
</tr>
<tr>
<td>SS x RT</td>
<td></td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>−.853</td>
<td>.284</td>
<td>3.006</td>
<td>.003</td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td>0.170</td>
<td>.253</td>
<td>0.674</td>
<td>.502</td>
<td>0.861</td>
<td>.278</td>
<td>2.231</td>
<td>.163</td>
</tr>
</tbody>
</table>

Note: SS = sensation seeking; RT = risk-taking propensity; O = openness to experience; RJ = risk justification.

**Fig. 2.** Moderation simple slope.
risk justification. The curiosity of sensation seekers is associated with greater openness to experience which develops cognitive decision making through developing the capacity to identify and interpret environmental factors that can be blamed when errors occur. The motivation to find new experiences increases the onset of cognitive inconsistencies and distracting thoughts among people with high level of openness (McCrae & Costa, 1997). As they experience cognitive dissonance, they become more focused on finding more excitement than positive learning experiences (McCrae, 1992) especially in relation to negative behaviors, although they have a capacity to use information and knowledge from their experiences to improve their behaviors (McCrae & Costa, 1997). As a result, they will likely also blame their experiences as factors for their poor behaviors. Results of this study suggest that behaviors associated with openness to experience trait may also not always be functional.

The findings of this study indicate the importance of considering personality characteristics and their interactions in predicting safety-related constructs, including risk justification. The findings are particularly important for the development of risk management and risk prevention programs in organizations since we identified that rewards and openness to experience are associated with external justification of risk and consequently non-ownership of safety related issues. The combination of both indirect effects and moderation using conditional direct effect analyses resulted in new interpretations, to the extent that high levels of sensation seeking and risk-taking propensity were associated with a high degree of openness to experience that influenced how individuals justified their actions.

In addition to replicating this study in different types of organizations and industries, future research should use observations and interviews to determine other predictors of external justification for use in the development of training programs. Future research should also determine whether external risk justification is related to actual increases in unsafe behavior. Finally, the study results provide an insight on how nurses with a high level of Openness to Experience believe they have control over external features in the environment. While we chose to focus on personality variables in this study, we recognize that external risk justification is also associated with Locus of Control (Rotter, 1966). Future research should consider if Locus of Control influences how people perceive risk justification incrementally over our model.

A limitation of this study was its use of a cross-sectional methodology which means that cause and effect could not be explained as the data were taken at one point only (Mann, 2003). Future research should include more professions and organizations to improve the generalizability of the results. In addition, while risk justification in this article only measure reasons behind why nurses work unsafely or took risks, it would be useful to determine how our model predicts risk justification after partiailing actual rates of unsafe behaviors. Future research might therefore also collect actual rates of unsafe behaviors.

In conclusion, this study provided further evidence as to how sensation seekers justify their safety related behaviors in nursing, and the model has generated two core results. First, sensation seekers with high levels of risk-taking propensity are more likely to perceive that support deficiencies are responsible for their unsafe work practices. Second, sensation seeking when re-expressed through openness to experience is also associated with external justifications of risk. These counter-intuitive results suggest that external risk justification is important to better understand.

References


