



# Proactive personality and situational judgment among civil flying cadets: The roles of risk perception and cognitive flexibility

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## ABSTRACT

The primary aim of this study was to investigate the relationship between proactive personality, risk perception, and cognitive flexibility on the situational judgment of flying cadets. For this, we collected self-reported data from 222 civil flying cadets from the Civil Aviation Flight University of China. The obtained results show that proactive personality has both a direct effect and an indirect effect mediated by risk perception on flying cadets' situational judgment; furthermore, the direct effect was found to be moderated by cognitive flexibility. In particular, cognitive flexibility weakened the relationship between proactive personality and situational judgment among flying cadets. Managerial implications of this study and future research directions are presented and potential injury prevention efforts of flying cadets are discussed.

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## 1. Introduction

It is commonly accepted that human factors may contribute to accident involvement in aviation (Lester & Bombaci, 1984). Shappell and Wiegmann (2009) concluded human factors to be contributing elements in 80% of all accidents. In particular, situational judgment was identified as the most central of these factors. Consequently, a variety of studies have been conducted to identify variables that may influence situational judgment errors in aviation. Situational judgment is part of the most central decision-making process and the capacity of pilots to achieve satisfactory outcomes can be divided into two main categories, namely rational judgment and motivational judgment (Jensen, 1995). Correspondingly, several studies reported that cognition components influence situational judgment of pilots including general cognitive processes (e.g., attentional strategy, expertise, information processing, and recollection of stored events), situation awareness, metacognition, and self-evaluation (Clevenger, Pereira, Wiechmann, Schmitt, & Harvey, 2001; Endsley, 1995; Kennedy, Taylor, Reade, & Yesavage, 2010; Schriver, Morrow, Wickens, & Talleur, 2008). Others studies discussed the importance of context-related cognitive skills (e.g., situation assessment, mental simulation, choice among alternative courses of action, and crew resource management) for pilots' situational judgment (Drinkwater & Molesworth, 2010; Hunter, 2003, 2006; O'Hare, 1990). However, several literature reviews have concluded that the majority of such aviation safety campaigns to change pilots' cognitive components and cognitive skills related to judgments during risky situations have not positively

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affected the number of accidents (Driskill, Weissmuller, Quebe, Hand, & Hunter, 1998; O'Dea, O'Connor, Kennedy, & Buttrey, 2010).

Given the unsuccessful intervention strategy, it is necessary to understand other factors that are linked to increases in situational judgment. Research suggests that there are a number of situational judgment error factors such as, personality characteristics that are more important than cognitive skills. These factors include risk tolerance (Ji, You, Lan, & Yang, 2011; Pauley, O'Hare, & Wiggins, 2008), locus of control (You, Ji, & Han, 2013), and perfectionism (Ji et al., 2017). The indirect effect of these personality factors might be underestimated with regard to the situational judgment among pilots. In particular, the role of social cognition variables in the relationship between personality and pilots' situational judgment should be taken into account. Ji et al. (2011) and You et al. (2013) reported that risk perception had mediating effects in the relationship between personality and safety operation behavior among pilots. Furthermore, Fornette et al. (2012) reported that the pilot's cognitive adaptation is essential for situational judgment and that it can be achieved through constantly adjusting their cognitive strategies according to environmental demands. Therefore, personality approach, social cognition approach, and cognitive adaptation may capture many of the above constructs and may thus, be of particular use in understanding situational judgment errors among airlines pilots.

### 1.1. Proactive personality

As a personality trait, a proactive personality (PAP) has clearly been defined as a stable tendency to effect environmental change (Bateman & Crant, 1993). Compared to a passive personality, people with PAP engage in altering an undesirable environment, seizing opportunities, and taking the initiative to achieve their goal (Crant, 2000; Seibert, Crant, & Kraimer, 1999). Bateman and Crant (1993) proposed that proactive people are adept in cognitively analyzing situations and actively take action toward solving the problem. PAP has also been suggested as a positive trait for other variables such as performance (Bakker, Tims, & Derks, 2012), work perception (Chan, 2006), and work-related learning (Parker & Sprigg, 1999). In fact, PAP is closely associated with self-efficacy. Seibert et al. (1999) suggested that proactive individuals have a strong sense of self-efficacy in working. Self-efficacy was strongly linked to work performance via meta-analysis (Stajkovic & Luthans, 1998). In aviation, Davis, Fedor, Parsons, and Herold (2000) clarified the positive effect of the general self-efficacy for pilot's training and performance by documenting the importance of general self-efficacy in the training setting. Chen and Chen (2014) indicated that self-efficacy poses direct and positive effects on pilots' safety behaviors. Based on the above views, we suggest PAP as a stable disposition toward proactive behavior that may be associated with performance. Situational judgment is often a precursor for performance. A safe pilot is also a proactive pilot who proactively changes the flying plane depending on the weather (Batt & O'Hare, 2005). Therefore, a pilot's proactive behavior is beneficial for the safety performance of flying. Consequently, we hypothesize that, *H1: PAP is a positive predictor of the situational judgment of flying cadets.*

### 1.2. Risk perception

Risk perception has been suggested as the crux for pilots in hazardous situations. As a context-related skill, risk perception allows pilots to identify risks inherent in a situation; this includes two elements: appraisal of the external information and of the personal capacities (Hunter, 2002). Inaccurate risk perception can lead to poor decision-making due to ignorance of or misinterpretation of hazard cues in relation to the pilot's own abilities. Consequently, numerous accidents can be ascribed to risk perception errors. Previous extensive research showed that the risk perception of pilots often affects the validity of their situational judgment. According to Orasanu and Fischer (1997) and Hunter (2006), risk perception is an essential cognitive activity for safety operations. Drinkwater and Molesworth (2010) reported that effective risk management is a key predictor for performance. Risk perception is a primary skill that ensures that pilots accurately make decisions and perform adequately. We accordingly propose the following hypothesis, *H2: Risk perception positively predicts the situational judgment of flying cadets.*

Furthermore, risk perception is closely related to a proactive personality. Seibert et al. (1999) argued that proactive individuals are good at exerting control over their work situation and at understanding the contingencies of their environment. Crant (2000) also pointed out that proactive people are more likely to conduct work management, such as seeking information about relevant tasks, creating a working plan, and persisting in the face of obstacles. In summary, PAP was deemed as a positive trait for task-related activity. Moreover, risk management is a central activity for safety flight in aviation. Several previous studies showed the positive effect of proactive behavior for flight safety (Batt & O'Hare, 2005; Kontogiannis & Malakis, 2009). Moreover, increased proactivity has been suggested as the core in the area of risk management technique development. Cacciabue, Cassani, Licata, Oddone, and Ottomaniello (2015) presented a proactive integrated risk assessment technique to improve both risk perception and safety in aviation. The authors suggested that proactivity manifests in the following way: *"It enables potential risk or hypothetical safety occurrences to be analyzed, drawing on the experience and knowledge of operational personnel about unsafe conditions and behaviors."* This can thus be seen as the significance of proactivity both in theory and in reality. A proactive personality, as a stable trait, has the propensity of proactivity; therefore, we assume that proactive individuals may have a stronger risk perception. As mentioned above, effective risk perception is particularly important for situational judgment. Researchers have suggested that risk perception is mediated by both situational factors and characteristics of the individual (Hunter, 2002; Ji et al., 2011; You et al., 2013). Thus, in light of both theoretical and experimental evidence, we propose the following hypothesis, *H3: PAP positively predicts the risk perception of flying cadets.*

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