Investigating the Effects of Safety Management System Practice, Benevolent Leadership and Core Self-evaluations on Cabin Crew Safety Behavior

Ching-Fu CHENA, Shu-Chuan CHENb*

Abstract: Drawing on the behavior theory, this paper investigates cabin crew safety behavior with regard to three aspects of affecting factors including individual, group and organization. Specifically, we specify perceived airlines’ Safety Management System practice, department managers’ benevolent leadership and individual core self-evaluations as three factors affecting cabin crew safety behavior, and we hypothesize upward safety communication as a mediator. We apply structural equation modeling to examine a hypothesized model using a sample data from flight attendants working for the Taiwanese international airlines. A variety of fit indices confirmed the overall model fit, and most of the hypotheses were found to be supported. The results reveal that cabin crews’ positive perceptions of the three indicators may lead directly to flight attendants’ willingness to conduct upward safety communication, which has a direct and significant effect on their compliance and proactive safety behaviors. The empirical implications are discussed, and directions for future research are identified.

Keywords: Cabin Crew; Safety Behavior; Upward Safety Communication; Safety Management System; Benevolent Leadership; Core Self-evaluations

1. INTRODUCTION

In most Asian countries, including Taiwan, cabin crews are widely seen as service workers and salespersons (Liang and Hsieh, 2005). Their professionalism in implementing cabin safety policies and ensuring safety on board tend to be underestimated. During flights, the primary job of the cabin crew is to ensure that all safety regulations are followed (Kao et al., 2009). Although this safety responsibility outweighs other cabin duties, such as serving drinks and meals, only recently have issues related to cabin crew safety behavior and safety role begun to receive research attention (Rhoden et al., 2008; Simpson et al., 2004). Cabin crews serve as the liaison between the cockpit, cabin and ground (Chen and Chen, 2012a), and communication has thus been long recognized as the essential element in good performance of cabin crew duties.

Hofmann and Morgeson (1999) propose that upward safety communication is closely related to the avoidance of adverse safety events. Meanwhile, it is widely recognized that employee reports of accidents, errors, near misses, and other operational problems are valuable to managers, as they can provide information that is unavailable elsewhere.

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producing opportunities to correct unsafe situations and to improve work systems (Cannon and Edmondson, 2005; Hogan et al., 2008). It is hence expected that the more flight attendants are willing to conduct upward safety communication, the better the understanding shared between them and managers, thus improving safety performance.

In practice, cabin safety requires more than cabin crews’ reactive behavior to cope with the variety of incidents and accidents that may occur in flight. Flight attendants’ proactive attitude toward teamwork and willingness to promote safety concepts are also considered to be critical for enhancing safety performance. “Cabin crews’ passive safety behaviors” describes flight attendants’ compliance with the safety policies and regulations issued by aviation authorities and airlines, and this is also known as safety compliance (Borman and Motowidlo, 1993; Griffin and Neal, 2000). Proactive safety behavior refers to cabin crew members using their initiative to carry out actions that go beyond their job descriptions to enhance safety performance, which has also been termed as “safety participation” (Fugas et al., 2012; Griffin and Neal, 2000). Given the paramount importance of safety performance, a deeper understanding of the safety behaviors of cabin crews and their affecting factors is necessary.

From the perspective of organizational behavior, factors affecting employee behavior can be categorized into three aspects; i.e., organization, group and individual (Robbins, 2001). The three aspects reflect the fact that an individual’s behavior stems from personal knowledge and values, as well as from the group norms and organizational cultures that one operates within (Bill, 2003). Taking cabin crews as an example, the specific personal characteristics of an individual are among the determining elements that decide whether someone is appropriate for this job. In addition, organizational culture may unconsciously impact how flight attendants respond to the stereotypical image of a cabin crew position. Moreover, airlines are composed of a variety of professional crews under the management of separate departments, and distinctive departmental subcultures and professional characteristics were observed in the prior qualitative research (Chen and Chen, 2011). The Cabin Crew department represents one of these specific groups. Cabin crew safety behaviors may thus be viewed as the result of a chain of social influence that combines individual, group and organizational attributes.

In the current study, we develop an integrated model of cabin crew safety behavior drawn on the organizational behavior theory (Robbins, 2001) and the communication theory (Hufmann and Morgeson, 1999). Specifically, we specify cabin crews’ perceived airlines Safety Management System (SMS) practice, department managers’ benevolent leadership and individual core self-evaluations as the three factors affecting flight attendants’ safety behaviors from organization, group and individual aspects, respectively. In addition, upward safety communication is hypothesized as a mediator. Flight attendants’ willingness to perform upward safety communication indicates that they place importance on safety. We thus assume that their perception toward upward safety communication may link directly to safety behaviors.

1.1 Upward safety communication and safety behavior

Over the last decade, the concept of safety communication has been broadly adopted in research measuring the safety climate in various industries (e.g. Cigularov et al., 2010; Lin et al., 2008; Mearns et al., 2003). Safety communication assesses how free and open employees feel about raising their concerns and discussing safety related issues (Hofmann and Stetzer, 1998). More specifically, upward safety communication refers to subordinates taking the initiative to express concerns or to propose recommendations about safety related issues to their managers (Hofmann and Morgeson, 1999; Kath et al., 2010). It not only reflects whether
companies provide a working environment that encourages communication, but also indicates how much employees value safety at work.

The Flight Attendant Manual Standard issued by Transport Canada (1996), indicates that it is the cabin crew’s responsibility to communicate any on-board safety concerns that they may have or that may be communicated to them by a passenger to the captain. While the duties and functions assigned to flight attendants in the interests of cabin safety are well established across the aviation industry, how the cabin crew perceives their own safety-related behavior, and what are the potential antecedents that may be attributed to it, have received relatively little attention by researchers.

Smith et al. (1978) indicate that open communication and frequent interactions between employees and managers are important factors that can lead to low accident rates. Working in the front line, flight attendants possess abundant opportunities to learn not only from the company’s training programs, but also from interacting with passengers and other professional crew members, such as pilots and maintenance staff. Because of the multi-functional roles, multi-tasking and teamwork that cabin crews need to perform on board (Chen and Chen, 2012a), good communication has long been recognized as one of the key job requirements of flight attendants. Working as frontline employees, flight attendants can easily observe the effects of company policy with regard to cabin safety and can also collect feedback from passengers. Cabin crew members’ willingness to conduct upward safety communication reflects the degree to which they perceive cabin safety performance as being important, and how much effort they are willing to devote to achieving it. Airlines can benefit significantly if the valuable information that cabin crews possess is used effectively and efficiently. It is also asserted that employee enthusiasm for conducting upward safety communication has a positive impact on reducing occupational accidents and near misses (Mearns et al., 1998; Probst, 2004). Based on these earlier studies, it is proposed that observing cabin crew’s upward safety communication behavior may help to comprehend cabin safety performance better.

Prior studies have proposed that safety communication is closely associated with employees’ safety behavior (Cigularov et al., 2010; Griffin and Neal, 2000; Parker et al., 2001), and this behavior has attracted increasing attention with regard to the human factors that are involved in work-related accidents (Fogarty and Shaw, 2010; Mullen, 2004; Neal and Griffin, 2006). Individuals develop a sense of job role on the basis of what they think that they are supposed to do or prefer to do (Graen, 1976), and a similar development process occurs with regard to the performance of safety behavior. Hofmann et al. (2003) extend the concept of role orientation to the occupational safety domain, and they define the citizenship behaviors that are related to workplace safety in terms of safety citizenship role. Based on the concept of organizational citizenship behavior (Organ, 1988; Podsakoff et al., 2000), which differentiates in-role (part of the role) behavior from extra-role (beyond the role) behavior, safety behavior may also be recognized as consisting of two categories of performance, compliance safety behavior and proactive safety behavior (Fugas et al., 2012).

Compliance safety behavior refers to correctly using protective equipment, abiding by safety policies and properly performing procedures to reduce the risk of potential hazards and injury, and this is part of the work role that cabin crews are trained to practice. However, Didla et al. (2009) argue that employee compliance with safety rules may only passively prevent accidents caused by violations, and they suggest that the continuous improvement of safety performance requires employees to participate proactively in safety activities. As for cabin crew, putting in extra effort to promote safety concepts in their off-hours is regarded as proactive safety behavior. This bi-dimensional safety behavior approach is consistent with the theoretical trend led by Griffin and Neal (2000), who differentiate safety behavior into two
types: safety compliance and safety participation. Safety compliance indicates the fundamental behaviors practiced by the employees to ensure personal and workplace safety. Safety participation refers to the behaviors that help develop a safety-supportive environment, instead of only working to guarantee personal safety.

Flight attendants with stronger willingness to conduct upward safety communication are assumed to comply more actively with safety rules and to participate in safety activities, and be more likely to take initiative to express their safety-related opinions. This research thus proposes the following hypothesis. 

HI. Cabin crew upward safety communication behavior is positively associated with their compliance and proactive safety behaviors.

1.2. Perceived SMS Practice

In recent years, airlines have relied on the practice of an SMS to integrate safety policies and to augment safety performance (Chen and Chen, 2012b). It is thus logical to describe how cabin crew members perceive their airlines’ Safety Management System (SMS) practice as the embodiment of how they perceive their airlines’ safety climate, while a number of studies have applied organizational safety climate to determine the effects on employees’ safety behavior (e.g., Cooper and Phillips, 2004; Fogarty and Shaw, 2010). SMS highlights the integration of the entire organization serving as one team, following principles that are laid down at the top to proactively manage safety (Chen and Chen, 2012b). The Federal Aviation Administration (FAA) describes SMS as a quality management approach to controlling risk, which also provides the organizational framework needed to support a safety culture (FAA, 2006). An SMS is also regarded as a methodology by which a company manages safety throughout the organization, utilizing a systematic approach to ensure that all parts of its business are addressed and that all risks are identified and subsequently managed (UKCAA, 2002).

SMS is developed on the basis of existing safety theories and models, and it acts as a coordinated, comprehensive set of processes designed to direct all accessible resources to manage safety in an optimal manner (Transport Canada, 2008). Galotti et al. (2006) state that a “system” represents the concept of an integrated set of processes which manage safety across intra-departmental boundaries. How employees evaluate their firms’ SMS practice may signal the effects of adopting such a proactive safety model. Cabin crew members’ assessments of their airlines’ SMS practice demonstrate their perceptions of the effects of their company’s efforts to embody the safety culture within the organization.

It is believed that an airline’s SMS practice positively impacts its cabin crews’ upward safety communication and safety behaviors, as the ultimate aim of SMS in the airline industry is to establish an effective aviation safety culture, which can detect and correct safety-related problems to prevent accidents (Lewis, 2008). A successful SMS requires airlines to motivate all employees to proactive participating in and promoting safety activities. If flight attendants perceive their airline’s SMS practice in a positive manner, it is more likely that they will perform safety behaviors proactively because they are part of the whole system.

Previous studies confirm the relationship between the implementation of an SMS and the attitudes of employees toward safety-related behaviors in aviation (e.g. Remawi et al., 2011). Accordingly, this study predicts that the better flight attendants perceive the SMS practice within their airlines, the more they will be willing to conduct upward safety communication, compliance and proactive safety behaviors. The following hypotheses are thus proposed.
H2. A cabin crew’s perception of their airline SMS practice is positively associated with their upward safety communication.

H3. A cabin crew’s perception of their airline SMS practice is positively associated with their compliance and proactive safety behaviors.

1.3. Benevolent Leadership

The majority of definitions of leadership contain a few basic elements, such as “group”, “influence” and “goal” (Bryman, 1992). Leadership may thus be viewed as the process of influencing others toward achieving a desired outcome inside a group. Previous research has continuously emphasized the significant effects that leadership may have on employee attitudes and behaviors (Yukl, 2002). For example, Clarke and Ward (2006) indicate that leadership style has a particularly significant impact on employees with regard to their safety participation. The causality between leadership and employee safety behaviors has been supported by a number of related studies (e.g. Hofmann and Morgeson, 1999; Yang et al., 2009; Zohar and Luria, 2003). The way that cabin crews perceive department managers’ benevolent leadership is thus adopted as another potential factor in the present study. Benevolent leadership has been widely observed in Chinese business organizations, as it conforms to the mores of Chinese culture and has been shown to enhance employees’ effectiveness to a greater degree than transformational leadership in the Chinese context (Chou et al., 2005). Our interest is to examine whether benevolent leadership may generate similar positive effects on cabin crew safety behaviors. More specifically, this paper applies cabin crews’ perception of department managers’ benevolent leadership style to observe its relation to flight attendants’ upward safety communication and safety behaviors. Benevolent leadership is used in the current study to manifest the targeted population’s Chinese cultural background. It is noted that in traditional Chinese societies leaders are expected to have a paternalistic role, with overtones of fatherly benevolence (Cheng et al., 2000; Pellegrini and Scandura, 2008). However, the benevolent leadership style has not yet been examined in the context of Taiwanese airlines, which can be seen as international organizations embedded in Chinese culture.

Benevolent leadership, which along with authoritarianism and morality is one of the three dimensions of paternalistic leadership style, refers to a leader who demonstrates individualized, holistic concern for his or her subordinates’ well-being, both personal and familial (Cheng et al., 2004; Farh and Cheng, 2000; Wang and Cheng, 2009). Benevolent leaders tend to act like parents and provide attentive care with regard to their followers’ work and personal lives, with this care being accumulated in exchange for the subordinates’ trust, loyalty and support. Prior research has consistently found that benevolent leadership in Chinese enterprises strongly enhances employee respect, gratitude and commitment with regard to their leaders (Cheng et al., 2004; Farh et al., 2006). The positive effects of benevolent leadership are reflected in a variety of favorable work outcomes, such as job performance, organizational commitment and citizenship behavior (Erben and Gunerser, 2008; Farh et al., 2008). However, the existing literature on this topic is marked by some limitations. One is the lack of attention paid to the causal relationship between benevolent leadership and employees’ safety related performance. This leads to one of the primary goals of the current study, which aims to establish a theoretical basis for connecting department managers’ benevolent leadership and cabin crew safety behaviors.

The nature of the work requires cabin crews to live with continuously changing schedules, and the significant job demands associated with their physically, psychologically and emotionally taxing work can often lead to mental or physical health problems (Chen and
Chen, 2012a; Heuven and Bakker, 2003). Furthermore, work-family conflict is found in the majority of flight attendants (Chen, 2006; Xanthopoulou et al., 2008). Because they are frontline employees, flight attendants need to be fully supported by managers in order to work with less pressure and to perform their best on board. The parental care and support expressed by benevolent leaders are thus expected to boost the cohesion among cabin crew members and to motivate them to work better as a team to achieve a shared vision.

Because benevolent leadership is positively related to employees’ in-role and extra-role behaviors (Chen et al., 2011), this study aims to explore whether a similar linkage exists between benevolent leadership and cabin crew safety behaviors, which are represented by upward safety communication, compliance and proactive safety behaviors in the current paper. We hypothesize that a department manager’s benevolent leadership may motivate flight attendants to carry out enhanced safety behaviors, as stated in hypotheses 4 and 5.

**H4.** The department manager’s benevolent leadership is positively associated with a cabin crew’s upward safety communication.

**H5.** The department manager’s benevolent leadership is positively associated with a cabin crew’s compliance and proactive safety behaviors.

### 1.4. Core Self-evaluations (CSE)

Cabin crews’ individual core self-evaluations (CSE) are also examined in this study for comprehending the effects on flight attendants’ safety behaviors. CSE is a higher order concept representing the fundamental evaluations that people have of themselves and their functioning in the environment (Judge et al., 2003). People with high CSE are assumed to have positive self-identification and achieve better performance (Erez and Judge, 2001; Judge and Hurst, 2007). Working in the sky, cabin crews need to carry out many tasks and remain emotionally stable, and it is assumed that flight attendants with high CSE may be more self-motivated to conduct safety behaviors.

Various constructs, such as personality traits, emotional stability, self-efficacy and self-esteem, are among the most commonly used personal focal antecedents that psychological studies apply to link with individual work outcomes (e.g., Barrick and Mount, 1991; Hogan, 1996; Judge et al., 2000; Wiggins, 1996). There are numerous references that support the argument that the aforementioned personal traits are highly intercorrelated, exhibiting strikingly similar relationships in various contexts (Bono and Judge, 2003; Francis, 1996; Roseberg, 1965). Accordingly, Judge et al. (1997) integrated four traits into a valid psychological construct, and termed it “core self-evaluations”, consisting of self-esteem, locus of control, neuroticism (or emotional stability), and generalized self-efficacy.

At a primary level, people with high CSE are commonly characterized by feelings of self-confidence, self-worth, self-potency, and freedom from anxiety (Hiller and Hambrick, 2005). Similar to other personal traits, CSE has been adopted as a predictor to examine work performance. Job satisfaction and job performance are the two main criteria of interest to industry/organization psychologists regarding both their conceptual and empirical relationships with the CSE traits (Bono and Judge, 2003; Erez and Judge, 2001; Judge and Bono, 2001). Research has found that people with positive self-evaluations not only are more effective at overcoming obstacles by using better problem solving strategies, but also perform better in positions requiring positive interpersonal relations or stress tolerance (Bono and Judge, 2003).

Flight attendants are commonly recognized as emotional workers (Hochschild, 1983). They work under tremendous stress because of a variety of passenger-related issues (such as unruly or demanding passengers) and unexpected situations (both service and emergency
related) occurring on board. Since good interpersonal skills and high stress tolerance are considered to be critical for this kind of work, the significance of a flight attendant’s personal characteristics should not be underestimated. People with high CSE are expected to perform cabin duty better than those with low CSE.

The relation between core self-evaluations and job performance, including task performance and organizational citizenship behaviors (OCB), has been confirmed in a number of studies (Judge et al., 1998; Piccolo et al., 2005; Sheykhshabani, 2012). This paper intends to extend the application by examining whether flight attendants’ CSE predict their safety behaviors, and specifically their upward safety communication, compliance and proactive safety behaviors. The related hypotheses are stated as follows.

$H_6$: A cabin crew’s CSE is positively associated with their upward safety communication.

$H_7$: A cabin crew’s CSE is positively associated with their compliance and proactive safety behaviors.

2. METHOD

2.1 Participants and Procedures

The study population is the cabin crew members who work for international airlines in Taiwan. Due to cabin crews’ shifted work schedule, the paper-based survey was delivered conveniently to flight attendants through each airline’s internal contact. Questionnaires with sealable stamped addressed envelopes were either deposited in the individual’s mailbox or distributed on board an aircraft. Data were collected during the three-month period from April to June, 2012. A total of 450 surveys were distributed. A total of 309 samples were returned, of which 296 were effective, representing an acceptable response rate of 66%.

The majority of respondents were young women, with 91.6% of the respondents being female, and most ranging in age from 26 to 30 (42.9%). The respondents’ years of tenure mainly fell into the ranges of 1-5 years (36.8%) and 6-10 years (24%). Regarding ranking, 72.3% of the samples were basic level flight attendants, and 8.4% had a position as chief purser. A total of 69.9% of the respondents were single and 83.8% of the respondents had no children. The major range of flight time within the previous three months was between 71 and 80 hours. Table 1 presents the demographic characteristics of the respondents.

2.1 Measures

The scales used to obtain the measures of the variables are described below. All items were rated on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree.

2.1.1 Perceived SMS practice (SMS)

The scale consists of two sub-constructs; i.e., Policy (PO) and Practice (PA), containing 17 items, based on the SMS practice evaluation scale developed by Chen and Chen (2012b). Cabin crews were asked to evaluate the practice of their company’s SMS according to the level of agreement with a number of statements in this study. Sample items include: “The top management participates in SMS-related activities” for Policy and “Employees periodically take training programs related to emergency preparedness and response plans” for Practice. The reliability coefficient values are 0.92 and 0.93 for Policy and Practice dimensions, respectively.
Table 1. Participant demographic characteristics

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Frequency</th>
<th>Percentage (%)</th>
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<tbody>
<tr>
<td>Gender</td>
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<tr>
<td>Female</td>
<td>271</td>
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<tr>
<td>Male</td>
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<tr>
<td>Age</td>
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<tr>
<td>Below 25</td>
<td>42</td>
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<tr>
<td>26-30</td>
<td>127</td>
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<tr>
<td>31-35</td>
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<tr>
<td>36-40</td>
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<td>Over 41</td>
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<td>3.4</td>
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<td>Tenure of Year in Current Company</td>
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<tr>
<td>Less than 1 years</td>
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<tr>
<td>1-5 years</td>
<td>109</td>
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<tr>
<td>6-10 years</td>
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<tr>
<td>11-15 years</td>
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<td>16-20 years</td>
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<td>Average Flight Time within Previous Three Months</td>
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<tr>
<td>Less than 70 hours</td>
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<td>16.2</td>
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<td>70-80 hours</td>
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<td>81-100 hours</td>
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<tr>
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<tr>
<td>Number of Children</td>
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<tr>
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<td>83.8</td>
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<tr>
<td>1 Child</td>
<td>35</td>
<td>11.8</td>
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<td>2 Children</td>
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<td>3 Children or More</td>
<td>3</td>
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2.1.2 Benevolent leadership (BL)
Managers’ benevolent leadership was assessed using five items taken from the subscale of the Paternalistic Leadership Measure developed by Cheng et al. (2000). This scale has demonstrated consistent and good psychometric properties in several studies (e.g., Chen et al., 2011). An example item is: “Beyond work relations, my supervisor expresses concern about my daily life.” The reliability coefficient in this study is 0.93.

2.1.3 Core self-evaluations (CSE)
The 12-items Core Self-Evaluations Scale (CSES) developed by Judge et al. (2003) was employed to measure cabin crews’ CSE. The CSES measures a single factor that is composed of self-esteem, locus of control, generalized self-efficacy, and emotional stability. Sample items are “When I try, I generally succeed,” and “Sometimes, I do not feel in control of my work. (reverse-scored)” The reliability coefficient is 0.89.

2.1.4 Upward safety communication (USC)
Five items from a scale reported by Hofmann and Morgeson (1999) were utilized to measure cabin crews’ willingness to conduct upward safety communication. To precisely identify the intention of cabin crews’ specific communication behavior, one item was added to the questionnaire: “I’d like to propose suggestions regarding safety issues.” Other example items include: “I feel comfortable discussing safety behavior with my supervisor,” and “I try to
avoid talking about safety issues with my supervisor. (reverse-scored)” The reliability coefficient for this scale is 0.88.

2.1.5 Safety behavior

Safety behavior items consisting of two components, namely compliance safety behavior (CSB) and proactive safety behavior (PSB), were adopted from Neal and Griffin (2006). Compliance safety behavior evaluates the core tasks that flight attendants have to accomplish to maintain flight safety. To precisely evaluate flight attendants’ compliance behavior, one item was reworded to “During ground check, I will make sure all emergency equipment has been well loaded.” Proactive safety behavior applied the three items of safety participation subscale to assess the extent to which cabin crews help develop an environment that supports safety. Some slight adjustments were made to the items to better match the work characteristics of flight attendants and the main focus of the present study. An example item is “I voluntarily carry out tasks or activities that help improve cabin safety.” The reliability coefficient values for safety compliance and safety participation are 0.94 and 0.93, respectively.

2.2 Data Analysis

The Cronbach’s α coefficient is applied to evaluate the internal consistency of each construct. Structural Equation Modeling (SEM) is carried out to evaluate the measurement and structural models by using the LISREL 8.52 computer program (Joreskog and Sorbom, 2001). Since all items are measured on an ordinal scale, the correlation matrix was used as input data, and the structural model was estimated with the maximum likelihood technique. According to Anderson and Gerbing’s (1988) two-step approach, a measurement model was first examined using confirmatory factor analysis (CFA) to assess its adequacy, followed by testing the structural model for statistical acceptability in the second step. Various fit indices were used to assess the fitness of the model, including the following: goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI) and root mean square error of approximation (RMSEA). As suggested by Hair et al. (2006), values of GFI, AGFI and CFI of 0.9 or above and RMSEA of 0.05 or less all indicate a good fit between the model and the data.

3. RESULTS

3.1 Measurement Model

CFA was conducted to analyze the validity and reliability of the six constructs. According to Hair et al. (2006), the convergent validity of CFA results has to be supported by item reliability, construct reliability and average variance extracted. As shown in Table 2, all t values appear to be significant (p < 0.01). The construct reliability (CR) estimates range from 0.90 to 0.97, well above the critical value of 0.70 suggested by Hair et al. (1998). The average variance extracted (AVE), which measures the amount of variance that is captured by the latent variable in relation to the amount of variance due to measurement error, lies between 0.54 and 0.91, also exceeding the value of 0.50 suggested by Fornell and Larcker (1981). These results indicate that the measurement items have high reliability and validity.

Discriminant validity was assessed by comparing the construct correlations with the square root of the average variance extracted (Fornell and Larcker, 1981). The results shown
in Table 3 indicate that the square root of the average variance extracted for each construct is greater than the levels of the correlations involving the construct, and thus discriminant validity is confirmed.

<table>
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<tr>
<th>Table 2. Convergent validity</th>
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<td>Constructs</td>
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<td>Core Self-evaluations</td>
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Note: ** denotes p < 0.01.

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<th>Table 3. Discriminant validity.</th>
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<td>Constructs</td>
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Note: * denotes p < 0.05, ** denotes p < 0.01.

SMS, Safety Management System Practice; BL, Benevolent Leadership; CSE, Core Self-evaluations; USC, Upward Safety Communication; CSB, Compliance Safety Behavior; PSB, Proactive Safety Behavior. Square root of average variance extracted (AVE) is shown on the diagonal of the matrix.
3.2 Structural Model and Hypotheses Testing

A structural equation model was applied to estimate the relationships between selected antecedents and cabin crews’ safety behaviors, with upward safety communication serving as a mediator. Figure 1 shows the estimated model with the standardized path coefficients. The fit indices of the structural model are summarized as follows: \( \chi^2 = 396.41 (p = 0.00) \), df = 150, \( \chi^2 / df = 2.64 \), GFI = 0.89, AGFI = 0.85, RFI = 0.98, NFI = 0.98, and NNFI = 0.98. The alternative indices are CFI= 0.98, RMR = 0.03, and RMSEA = 0.07. A comparison of these results with the corresponding critical values suggests that the conceptual model fits the empirical data reasonably well (Fornell and Larcker, 1981).

Regarding the hypothesis tests, five out of the seven hypotheses are supported. The effects of upward safety communication on both types of safety behaviors are significantly positive (\( \beta_1 = 0.26, t= 2.43; \beta_2 = 0.39, t = 4.98 \)), indicating that the more positive attitude flight attendants have with regard to upward safety communication, the more likely it is that they will perform compliance and proactive safety behaviors. H1 is thus confirmed. Regarding the direct effect of the three exogenous predictors on cabin crews’ upward safety communication, all paths show a significantly direct influence, and thus H2, H4 and H6 are all supported. The statistical data also reveal the direct effect that perceived SMS practice has on cabin crews’ compliance and proactive safety behaviors (\( \gamma_2 = 0.31, t = 3.42; \gamma_1 = 0.20, t = 3.09 \)), and H3 thus is supported. While department managers’ benevolent leadership has a direct effect on cabin crew’s proactive safety behavior (\( \gamma_6 = 0.15, t = 2.60 \)), it does not have the same effect on their compliance safety behavior (\( \gamma_2 = 0.09, t = 0.85 \)). Meanwhile, flight attendants’ CSE has a significant positive effect on their compliance safety behavior (\( \gamma_6 = 0.15, t = 2.60 \)) and insignificant effect on their proactive safety behavior (\( \gamma_2 = 0.07, t = 1.54 \)). Therefore H5 and H7 are found partially supported. The three selected predictors are all proved to influence cabin crews’ safety behaviors directly or indirectly, via the full or partial mediating effects generated by upward safety communication. The mediating role of flight attendants’ upward safety communication thus has been confirmed.

4. DISCUSSION

4.1. Key Findings & Managerial Implications

Cabin crew safety behavior is critical to an airlines safety performance and may directly affect air travelers’ safety concern. In the current study, we examined the effects that cabin crews’ perceived airlines SMS practice, department managers’ benevolent leadership and individual CSE have on types of flight attendants’ safety behaviors. The results show that these behaviors are simultaneously and positively associated with all three factors. Based on the empirical data, the mediating effect of upward safety communication has also been demonstrated. The first conclusion of this study is that when cabin crew members are willing to conduct upward safety communication, they are more likely to perform safety behaviors well.

In general, flight attendant respondents recognize that airlines endeavor to practice SMS, as the mean scores of two SMS sub-constructs are 4.83 and 5.11, respectively. Note that airlines’ with an accredited SMS practice may be viewed as having a positive organizational safety culture (Lewis, 2008). From a practical perspective, the practice of an SMS demonstrates the determination of an airline’s executives to improve safety, and this can then convey to all employees the importance that their company places on this issue (Hsu et al., 2010), with safety then regarded as a collective responsibility. With the use of an SMS that
aims to integrate the entire organization as one team, following principles that are laid down at the top, it is more likely that cabin crews will be motivated to conduct upward safety communication and safety behaviors, based on empirical evidence provided by the present study. This linkage between an airline’s SMS and flight attendants’ safety behaviors supports the findings of Remawi et al. (2011). The present research also reveals that cabin crews’ perception of SMS practice has more predictive power with regard to their safety behaviors than the other two selected factors, since it shows the greatest total effect. Airlines may rely on the practice of an SMS not only to support a positive safety culture (FAA, 2006), but also to increase cabin crews’ willingness to perform safety behaviors. Therefore, it is strongly recommended that airlines should dedicate more efforts to performing and promoting SMS to enhance cabin crew safety behaviors.

To the best of the authors’ knowledge, the present study is one of the first to investigate whether benevolent leadership leads to subordinates’ safety behaviors. The results support the positive relations between department managers’ benevolent leadership, cabin crews’ upward safety communication and proactive safety behavior, while the linkage between benevolent leadership and flight attendants’ compliance safety behavior was found to be insignificant. These findings do not entirely reconfirm the strong causality between leadership and employees’ safety behaviors, which previous research observed (e.g., Clarke and Ward, 2006; Yang et al., 2009). However, the insignificant linkage between department managers’ benevolent leadership and cabin crews’ compliance safety behavior is unexpected but comprehensible. It is mandatory for all cabin crew trainees to pass through safety and emergency procedure training before being qualified to work as flight attendants (Rhoden et al., 2008). Flight attendants tend to formulate rules of thumb for teamwork and it is thus expected that they will follow this training and comply with the various situations that may arise on board within limited time. Compared with managers’ leadership, personal safety awareness and cooperation between cabin crew members seem to have more direct influences on how flight attendants obtain their compliance safety behavior.

Nevertheless, the considerable effect that managers’ benevolent leadership has on cabin crews’ proactive safety behavior deserves further attention. When flight attendants take the initiative to participate in safety related activities, or help develop a safety-supportive environment, they not only reveal their significant recognition of the importance of safety, but also demonstrate their willingness to perform proactive safety behavior. Since reciprocal relationships are highly valued in a Chinese cultural context, social exchange theory has been applied in the current paper as the theoretical framework linking leadership styles to employee outcomes (Chen et al., 2009). The study results provide valuable evidence in support of the argument that cabin crew members may transform the respect, gratitude and commitment that they feel toward a benevolent leader into making greater efforts to promote safety (Cheng et al., 2004). To motivate flight attendants to communicate upward regarding safety issues and then ensure good safety performance, it is important to encourage department leaders to express personal concerns and cares with regard to their staff. If flight attendants view themselves as working in a warm family-like environment, they are more inclined to participate in safety promotion during off-hours. Accordingly, it is noteworthy that the low mean score of benevolent leadership construct in the current study (M=3.82) suggests that flight attendants perceive insufficient fatherly benevolence from department managers. It is thus strongly recommended that airlines should be aware of the positive effects of benevolent leadership, and should encourage managers to employ it as a management technique when supervising cabin crews.

In terms of the possible effects of cabin crews’ CSE, the estimated path coefficients reveal significant impacts on upward safety communication and compliance safety behavior,
but an insignificant effect on proactive safety behavior. Although the relation between CSE and job performance (e.g. organizational citizenship behaviors) has been supported in previous studies (Judge et al., 1998; Piccolo et al., 2005), to date there has been a lack of empirical data to confirm the causality between individual CSE and safety behavior. We thus provide the preliminary evidence which shows that individuals tend to perform their compliance safety behavior better when they have higher levels of self-esteem, generalized self-efficacy, locus of control and emotional stability. Since these characteristics are fundamental with regard to how one appraises oneself, others and the external environment (Judge et al., 1997), people with higher CSE perceptions are likely to have more positive attitudes toward their personal obligations and to work harder to ensure the completion of their designated tasks. In the case of cabin crews’ safety responsibilities, this indicates that flight attendants will pay more attention to their designated safety responsibilities, including reporting irregular situations and conducting a variety of mandatory safety checks. As for cabin crews’ proactive safety behavior, the results of this study do not support the significant effect of CSE that was hypothesized. From a comprehensive point of view, cabin crews’ proactive safety behavior identified in the present paper is more closely related to the group and organizational levels of the expected tasks than the personal one. Despite the fact that flight attendants’ perceived CSE do not directly lead to proactive safety behavior, they will perform it when they have a positive attitude to conduct upward safety communication, which involves interacting with others rather than merely being self-administrated. Airlines thus may consider applying items from CSE surveys in written tests or face-to-face interviews when recruiting flight attendants to help identify the more appropriate candidates.

4.2. Limitations & Future Research

Based on cabin crews’ perceptions, this study explores the causal relationships between airlines SMS practice, cabin crew department managers’ benevolent leadership, and flight attendants’ CSE and their safety behaviors. Despite the strengths of this work, there are several limitations that suggest directions for future research. First, this work presents a preliminary approach to the focal issues by applying single antecedents to represent cabin crews’ perceptions of organizational (e.g., airlines’ SMS practice), group (e.g., department managers’ benevolent leadership) and individual (e.g., flight attendants’ CSE) factors, and future research may work to expand the model by applying more factors. Moreover, in addition to using flight attendants as the only data source, gathering multi-level data from managers to allow construction of a more complex hierarchical model will be beneficial for enriching the research findings. Besides, the results of this study are mainly restricted to local flight attendants working in Taiwanese international airlines, and may not apply to cabin crews from other countries. Therefore, a cross-cultural study of cabin crews of different nationalities would be a valuable contribution to this domain. It is also recommended that future researchers should conduct a cross-level investigation regarding how organizational, group and individual antecedents generate interacting influences on cabin crews’ safety behaviors, since this may provide more comprehensive insights into the related causal linkages.

5. CONCLUSION

The current research aims to explore the causal relationships between cabin crews’ upward safety communication, two types of safety behaviors and the selected indicators. The
proposed conceptual model is regarded as a preliminary attempt to simultaneously assess the causality that exists between multi-factors and flight attendants’ safety behaviors. The empirical results indicate that cabin crews’ perception of their airline’s SMS practice has significant effects on their upward safety communication, compliance and proactive safety behaviors. In addition, flight attendants are more likely to conduct upward safety communication and proactive safety behavior when under the supervision of benevolent leadership. Furthermore, the higher flight attendants evaluate their own CSE, the more likely it is that they will comply with safety regulations and follow standard operating procedures. The findings of this study contribute to enhancing the limited literature concerning flight attendants’ safety behaviors and providing some significant managerial implications. Overall, the results suggest that airlines may well utilize the positive effects of SMS practice, department managers’ benevolent leadership technique and flight attendants’ individual CSE to enhance cabin crew safety behaviors.

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