

## CHAPTER 3

### REVIEW OF LITERATURE

The objective of the literature review was to explore studies related to the design of uniforms, specifically flight attendant uniforms. The search revealed few studies related to uniform design and no studies related to any aspect of the flight attendant uniform.

The most current studies related to the design of work clothing, which used similar instruments and frameworks to gather the design criteria necessary to develop a final set of garments were selected. The selected literature was organized as follows: 1) studies leading to the development of the idea for the flight attendant study, 2) development of the preference measures supporting the development of the flight attendant preference measure, 3) non-uniform studies related to flight attendants, and 4) design process frameworks and their relationship to the flight attendant uniform design.

#### Idea Development

Early in the literature review, studies related to needs assessment and the researcher's discovery of Orlando-DeJonge (1984) functional design process were instrumental in generating the idea of the flight attendant uniform study. Illmarinen, Tammela & Korhonen (1990) conducted a needs assessment of new functional work clothing for meat-cutters. Interviews with the wearers revealed a need for protective clothing from extreme cold environmental conditions that also allowed mobility and flexibility of the hands and arms. Prototype work clothing was developed and wear tested, design changes continued until a final set of work clothes were produced.

Another needs assessment was conducted by Brandt & Cory (1989) with cleanroom workers in the microelectronics and semiconductor industry. The industry recognized that the garments in use at the time of the study were incapable of isolating and protecting microelectronics and semiconductors from the contamination generated by personnel. A two-year investigative process of interviews, questionnaires, and literature reviews revealed the design criteria necessary to develop new cleanroom garments. Prototype clothing were developed and wear tested by workers. These two studies generated the idea of a needs assessment for the flight attendant uniform study.

The functional design process "takes the designer step-by-step from the initial idea through an evaluation of the final design" (Orlando-DeJonge, 1984 p. viii). The design process is discussed in detail in the contextual framework section of this chapter.

#### Development of Preference Measure

In the Vass (1989) study, wearer preference measure is defined as wearer tolerances of design features. Vass stated "design tolerances are the end product of wearers' surveys" (p.13). For the flight attendant research, design criteria are the end product of the wearers' surveys, and preferences are the most desired features. Therefore, the flight attendant wearer preference

measure was defined as: the wearer's threshold for the most desired design features. An instrument was developed to gather the most desired design features from flight attendants based on their working expertise and background knowledge of the researcher. The related studies revealed the use of two types of preference measures:

- 1) Significant Others (Cunningham, 1995)
- 2) Wearers (Boles, 1982; Feather, Ford & Herr, 1996; Mullet, 1984; Vass, 1989; Workman, 1991)

### Significant Others

A significant other preference measure registers the tolerances of design features by individuals that are both different from and of consequence to the wearer. In the Cunningham (1995) study of the effect of clothing on jurors' evaluations of the credibility of female attorneys, the significant other was the jurors. The purpose of the study was to determine which garments worn by a female attorney would most often convey impressions of the attorney's credibility to jurors. The instrument consisted of a series of garments•combinations that had been worn by attorneys in high profile trials. Jurors viewed pictures of the same attorney in eleven different garment combinations and evaluated them on a semantic differential to measure credibility. Each garment was classified in terms of three garment components: color/color combinations, silhouette, and interior design lines. Each component was classified as traditional, moderately traditional or non-traditional. The classifications of silhouette and interior design lines were adopted for the development of the hypotheses in the flight attendant study.

### Wearers

By definition, the wearer preference measure is the wearer/user tolerances of design features (Vass 1989). This literature research yielded two sets of wearers: 1) uniforms and 2) non-uniforms.

### Uniforms

According to Fairchild's Dictionary of Fashion "Uniforms are any specific type of apparel required for wear for a specialized occupation or sport. They have been worn throughout history to denote status or trade of an individual" (Calasibetta, 1988, p. 593).

"The uniform identifies group members, helps insure that organizational goals will be attained, and orders priorities of group and status demands for the individual" (Joseph, 1986, p.66).

Uniform design for foodservice workers was the subject of the Workman (1991) research project. The guidelines for selecting appropriate uniform colors and design features to follow the image and theme of the restaurant was dictated by the restaurant owners. A questionnaire was developed for interviewing employees regarding their observations about the existing uniforms and opinions about the new designs. "The questionnaire included items on the amount of time uniforms were worn, methods of care, uniform design details, movement requirements and thermal needs" (p.19). On site visits were made to various restaurants to observe employees in action. The process framework they used included steps of the Jones' (1970) design method.

The same steps were used in developing the flight attendant study. A list of questions related to uniforms was developed for interviewing flight attendants preliminary to the

development of the questionnaire. This method enabled the researcher of the flight attendant study to develop pertinent questions for the final questionnaire.

Similar questions were addressed for the flight attendant research as for the foodservice workers.

The purpose of the study by Feather, Ford & Herr (1996) was to determine female collegiate basketball players' contentment with their bodies and current uniforms; their satisfaction with present uniform fit compared to garments they normally wear; and players' preferences for basketball uniform designs. The instrument was a self-administered questionnaire composed of six sections: a body cathexis scale, a body form schematic, garment fit satisfaction evaluation, options for design preferences of basketball uniform components, demographic information and an open-ended opportunity to comment on their uniforms. Uniforms were sketched using flat line drawings, and each piece of the uniform was divided into four design features: jersey (neckline, armhole, length and hemline) and the shorts (style, vents, waistband width and waistband style). Each design feature had five options. Subjects were asked to select the design features they preferred for their jerseys and shorts. Comments, both verbal and sketches, were invited about the uniforms and uniform preferences. The idea of sketching the uniform pieces and design features was initially used in one version of the flight attendant uniform questionnaire. After careful consideration the decision was made to eliminate that technique because the researcher believed it would lead the flight attendants responses toward her own biases of the traditional uniform. The objective of the flight attendant questionnaire was to gather preferences of the flight attendants based on their expertise not on the biases of the researcher for the traditional uniform garments. The opportunity for open-ended comments about the uniform was adopted for the flight attendant uniform study.

### Non-uniform

Boles (1982) wearer preference survey of male indoor exercisers determined tolerance of design details and garment characteristics using generic categories and questions related to the upper and lower body. These questions were adapted for the section on upper body garments of the flight attendant questionnaire, categories included: neckline shape, sleeve length and shirt length. Similar categories and questions were adapted for the lower body garments of flight attendant uniforms: pants leg length, waist type, and waist opening. The use of open ended comments was also adopted.

Vass (1989) examined the critical factors concerning preferences for the upper body garment of female violinist wearers in a concert performance setting. The instrument measured clothing problems as trade-off features of their favorite and typical concert performance upper body garments. The questions of fabric choice and types and placement of closings was adapted from the Vass (1989) instrument for use in the flight attendant instrument. Like the flight attendant study, the focus of the Vass (1989) measure was on the ideal characteristics of the preferred garments.

Mullet (1984) assessed the paddling jacket needs of male kayackers. The use of cinematography determined the physical needs and biomechanical needs of the kayacker while a questionnaire was used to obtain information concerning the preferences of the kayackers. The questions were based on the observations and experience of the researcher in kayaking and clothing and textiles.

Observation and experience were also the foundation of the flight attendant research. The questions for the flight attendant questionnaire were based on observations of flight attendants, unstructured interviews, background experience of the researcher as a flight attendant, knowledge of clothing and textiles, and other studies previously mentioned.

The literature that follows are studies related to flight attendants but not to uniforms. The studies are typical of studies normally related to the flight attendant. The studies give both a context for the flight attendant and the uniform, as well as, a look at the state of research on issues surrounding the flight attendant.

### Studies related to Flight Attendants

The flight attendant studies are organized as follows: 1) physiological/health profiles, 2) career development, and 3) work issues.

#### Physiological/Health Profiles

The effects of four-day round trip flights (Helsinki-Los Angeles-Seattle-Helsinki) were studied on the circadian rhythms of salivary melatonin (MT) and cortisol (COR) in 35 flight attendants (Harma, Laitinen, Partinen, & Suvanto, 1993). Jet lag was the motivation for this study. Jet lag is thought to be due to the disruption of the circadian rhythmicity. Flight attendants are exposed not only to jet lag but also to physically and mentally stressful work in the cabins, due to inappropriate working conditions and emotional pressure. Fatigue is also experienced frequently by flight attendants. The results indicated that the restitution time of five days at the home base is on the average proper for recovery, if a four-day round trip flight over 10 time zones takes four days or less. The resynchronization rate of salivary hormones after westward, outgoing flights is faster than the resynchronization rate after the eastward return flights.

Harma, Partinen, & Suvanto (1994) studied the effect of a four-day round trip flight over 10 time zones on the sleep-wakefulness patterns of airline flight attendants. For this study thirty-five flight attendants between the ages of 21 to 50 kept daily logs on sleepiness, the time when going to bed, and sleep quality. In addition, the autonomic sleep phases of some subjects were studied by the static charge sensitive bed (SCSB) method. The working hours of flight attendants are irregular; night and evening shifts as well as early morning shifts are frequent. As both shift work and transmedian flights cause disturbances of sleep-wakefulness, it is often hard to estimate a sufficient time for recovery after the flights. The results of the study indicate that most flight attendants have significant disturbances in sleep quality after transmedian flights. Sleep disturbances increase after both westward and eastward transmedian flights, but differ from each other in specific features.

Smolensky, Lee, Mott and Colligan (1982) reported the results of a health survey on over 3000 female and male flight attendants conducted in 1978 by the Association of Flight Attendants. Some common complaints of the flight attendants were fatigue, skin problems, lack of sleep during layovers, emotional pressures, and stress of physical requirements of the job. Most needed 11-20 days annual sick leave.

The results of a study exploring the incidence of illness absences among forty- one flight attendants compared with forty-one “traditional 9-to-5” type workers indicated that flight attendants are at greater risk than traditional workers of contracting viral illnesses due to 1) exposure to hundreds of different people each work day, 2) specific stressors, and 3) irregular work schedules (Huston, 1993).

Nutt-Birigwa (1986) developed a questionnaire to measure the amount of perceived stress flight attendants experience and if any flight attendant characteristics relate to their levels of stress. A questionnaire consisting of 116 items was distributed to 250 flight attendants with at least six months seniority representing nine different airlines. The eight stress factors were management, personnel, preflight, inflight, postflight, financial and family. A few of the 16 characteristics were age, length of service, number of hours flown, number of children, etc. The results indicated that the highest correlation of stress was between the number of hours flown per month and number of children.

Emergency stress among flight attendant personnel was the subject of research by Rhodes (1993). The objective of this research was to examine specific psychosocial factors that may influence the impact of involvement with a life threatening commercial airline accident among flight attendants. The psychosocial factors identified were the degree of post traumatic symptomatology at the time of the survey, the degree of impact on peer relationships, changes in the perception of the world as a safe place and manifestations of depression or anxiety. The variables were studied in relation to the victim’s proximity to the event either as a direct participant in the emergency or as a peer having a close relationship with a crew member who was involved.

In the Rhodes’ study, a survey questionnaire was used to gather data during the fall and winter of 1992 from a sample of 100 flight attendants obtained from random surveying at flight attendant crew lounges at Miami and Ft. Lauderdale airports. Surveys were also collected from victims of accidents identified by flight reports filed at two major airlines. Findings revealed both direct and indirect involvement in an airline emergency produced an elevation in the post-traumatic symptom of hyperalertness in the sample population.

### Career Development

Lessor (1982) fieldwork research of the career development of airline flight attendants revealed several factors related to the conversion of short-term (2 years) employment as a flight attendant into a long-term career. The major factors were:

1) change in women’s own view of their work lives, 2) four major social movements-- civil rights, feminism, occupational health and the labor movement; and 3) the context of technological innovation and socioeconomic change in the commercial aviation industry. These factors enabled women to redefine their work participation and establish legitimacy as long-term workers.

Rozen (1988) studied the causes of the upheaval that swept through the flight attendant unions in the mid 1970s shifting control of attendants’ collective bargaining from parent unions dominated by male occupations to the flight attendants’ own predominantly female unions. When the number of flight attendants on each aircraft increased, the existence of an occupational community among flight attendants became an organizational resource. Ties to the labor force

increased when new definitions of sex discrimination ended no-marriage rules and age ceilings. The women's movement raised flight attendants' consciousness to the increase of power through numbers and occupational community. Heightened concern with working conditions, led to a decreasing tolerance of the shrinking autonomy offered by parent unions.

### Work issues

Communication and coordination in the commercial aviation industry was the topic of the Chute (1994) study. Misunderstandings, attitudes, and interactions between crew members and their possible impact on aviation safety were examined. The survey revealed flight attendant confusion regarding appropriate conditions for violating the sterile cockpit regulation of no entry into the cockpit during takeoff and landing, as well as concern about the frequency of flight-deck briefings of the cabin crew and the frequency of crew introductions.

### Design Process Frameworks

“The Design Process is to work through the ignorance-of-the new, with which the problem begins, to the knowledge-of-the new, with which the problem ends. Knowledge of what the problem really is, as well as of solutions” (Jones, 1992, p. 57).

In contextual design, some of the responsibility is transferred from the designer to the user and maker. The creation of a context creates a situation in which it is possible for others, for us all, as users, wearers, makers, imaginers, to determine the total (Jones, 1992). “An important principle the designer should remember is to choose whatever method will tell what one doesn't know but needs to know, in order to proceed, what will help to identify the questions that need to be asked, then look for the best way to get the answer” (Jones, 1992, p.xxv).

Three essential stages of the design process are 1) analysis (involves both rational and intuitive actions, and legwork). 2) synthesis and 3) evaluation (Jones, 1992). The following design process frameworks follow the essential stages to aid the designer in identifying the questions and then provide an order in which to proceed to produce the desired results. All the frameworks identify the problem in the first step. The approach may vary, but it is an essential first step (the beginning of the analysis).

In the 1950s Christopher J. Jones first became involved with design methods while working as an industrial designer in Britain. During this time he became involved with ergonomics. Jones set about studying the design process being used by engineers, and the results of those studies showed Jones that the design process didn't allow for an understanding of the end user needs and the application of ergonomic principles. That study prompted him to further study the design process and in doing that hit on what is now called “design methods” (Jones, 1992). Jones' main concern was to make designing better and more responsive to user needs. Over time Jones has developed thirty-five new methods as an extension of the original philosophy. Jones' design methods and philosophy is the forerunner of the design process frameworks utilized in the studies reviewed for the flight attendant study. Even though Jones was working in the industrial field, his design applications are easily adapted to the field of clothing and textiles.

When the Department of Clothing and Textiles at the University of North Texas was asked to design new uniforms for a major restaurant chain, Workman (1991) directed an apparel design class through the use of the Jones' technique of searching for visual inconsistencies to design the uniforms. The technique is a method of exploring design situations with the aim of finding directions in which to search for design improvements. The technique involves the following four steps:

- 1) examine samples and/or photographs of the existing design,
- 2) identify apparent inconsistencies and contradictions in the arrangement and purposes of components of the design,
- 3) infer reasons for these inconsistencies and look for causes of design change, and
- 4) envisage ways of removing inconsistencies and of adapting to external causes of change.

Applying these steps the students developed a list of design criteria which outlined the factors with which the restaurant uniform should be compatible. Visual inconsistencies identified by the students were between parts of the uniform, between the uniform and the wearer, and between the uniform and the situation. In preparing the proposed designs for the new uniforms, students were conscious of the importance of maintaining consistency between the uniform and the accessories, between the uniform and persons wearing it, and between the uniform and the situation in which it would be worn. "When a design has unity, the garment functions and its structural parts are practical, comfortable, and well-related to each other, to the body and to the situation in which it is worn" (Workman, 1991, p.45). Prototype uniforms were produced and wear tested until the ideal garment was achieved. The realization of unity between the flight attendant, uniform, duties, and environment was a goal of this research.

Orlando's New Design Process Framework (1979) introduced a design process known as "functional" design, which was based on the strategy developed by J. Christopher Jones (1970). Developed for functional apparel design, the process "takes the designer step-by-step from the initial idea through an evaluation of the final design." (Orlando-DeJonge, 1984, p. viii) The design process framework includes the following steps:

- 1) begin with a request for clothing to meet a special need,
- 2) design situation is explored,
- 3) problem structure perceived,
- 4) specifications described,
- 5) design criteria established,
- 6) prototype developed (Orlando, 1979; Orlando-DeJonge 1984)

This process is used for protective wear, such as the fireman's turnout suits, gear for many contact sports, and for groups with special needs for physical disabilities or working demands. The flight attendant uniform is an example of a group with special needs to meet the demands of the job. The Orlando design process is another framework which guided the researcher to collect the design criteria needed to develop the ultimate flight attendant uniform. The foundation of the flight attendant study was founded with this process.

A contextual design process framework developed by J. F. Boles (personal communication, February, 1996) had its genesis during an industry apparel design project in 1982 and is still in its' evolution even today. The four-part contextual framework incorporates

the idea development with needs assessment, prototype development and evaluation. This contextual design process framework is one developed specifically for research in clothing. The needs assessment philosophy makes designing more responsive to user needs. The solution to the design problem is addressed through a series of four logical steps:

- 1) idea development by observation, interview, and experience (of the researcher)
- 2) needs assessment of the effect of the activity and environment on the wearer/user,
- 3) prototype development as a result of the design criteria determined through the needs assessment,
- 4) evaluation/wear test in the field and/or laboratory based on the criteria used to develop the prototype. (see Figure 1, Appendix A)

The Boles' contextual design framework was a guide for the idea development and needs assessment of the flight attendant uniform study. Having completed the first step and a portion of the second step, steps three and four are the logical progression of this investigation to complete the flight attendant uniform development goal.

Mullett (1984) explored the needs assessment aspect of the Boles contextual design framework using the needs assessment model of Kaufman (1979). The Kaufman method begins with the circumstances and attempts to identify the need. Discrepancies between the ideal goal and what actually exist are recognized. While attempting to define the problem or need correctly before moving to solutions, Kaufman's problem-solving process follows a systematic approach consisting of the six steps listed below:

- 1) identify the problem based upon needs,
- 2) determine solution requirements and identify solution alternatives,
- 3) select best solution strategies from among the alternatives,
- 4) implement selected methods and means,
- 5) determine performance effectiveness,
- 6) revise as required,

As a kayaker, Mullett had the opportunity to experience the problems of the paddling jacket in the wearer's natural environment. This knowledge helped to lead Mullett through the next steps of the needs assessment. Each of the design process frameworks reviewed contributed in part to the design process used in the flight attendant uniform study.