

**WOMEN IN THE ANTARCTIC:
RISK-TAKING AND SOCIAL CONSEQUENCES**

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Research has indicated that women tend to avoid activities that may result in the possibility of failure, and that women predominate in fear of failure while men are more likely to engage in risk-taking. What is fearful about failure seems to be the potential negative social consequences, and women are socialized to value social support. In order to investigate risk-taking among women, the present study interviewed 36 women who had recently returned from the Antarctic. Women who go to the Antarctic are in nontraditional roles (scientists in male-dominated fields, Navy personnel, or civilian support staff). Results indicated that the participants tended to compare their Antarctic experience to even riskier situations, so that it seemed safe in comparison. There was a discrepancy in the types of risks that women perceived before going with those that actually occurred when they were in the Antarctic, and a sense that some women used denial as a coping strategy. Most people, including friends, family members, and co-workers, were supportive of the women's decision to go to the Antarctic. About half the women had some lack of support (often from mothers) but were able to overcome interpersonal barriers to take the risk of travelling and working in the Antarctic.

Psychological research has been conducted in the Antarctic since the 1950s and has examined factors that contribute to stress and adjustment of the people who live and work "on the ice" (see

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Rothblum, 1990a; Suedfeld, 1991b; for reviews). The extreme Antarctic climate, isolation, and living conditions have prompted a number of investigations, almost exclusively with male participants. The present study obtained information from women who have recently returned from the Antarctic. Women are relative newcomers to the three groups of people in the United States Antarctic Program: scientists and scientific support staff, military personnel, and civilian contractors. Although the majority of Antarctic residents are men, the proportion of women in the Antarctic relative to men has been increasing steadily. Most women who seek Antarctic duty, including scientists, military personnel, and civilian support staff, are engaging in non-traditional roles for women.

This study had two goals. The first goal was to investigate risk-taking among women. Second, the study examined the social consequences of risk-taking for women. Women are socialized to value social relationships, and the research on fear of failure has indicated that what is fearful about failure is the anticipated negative interpersonal consequences (e.g., fear of rejection) rather than career or work-related consequences. Thus, the study focused on the degree of social support that the women received about their decision to go to the Antarctic.

Risk-taking Among Women

In a society that values achievement and success, the possibility of failure is often minimized or denied. Although many individuals strive for success, others behave in ways that reduce the risk of failure, even at the cost of attaining success. The concept of *fear of failure* has been investigated from several different perspectives in social, developmental, and clinical psychology (see Rothblum, 1990b, for a review of this literature). Although these perspectives differ in theoretical conceptualization and research methodology, all of them have found women to report more fear of failure, and behave in ways that express more fear of failure, than do men (Rothblum, 1990b). The first author's research and writing on fear of failure have focused on assessing the cognitive-behavioral antecedents and consequences of fear of failure, and on investigating gender differences in fear of failure (Beswick, Rothblum, & Mann, 1988; Rothblum & Cole, 1988; Rothblum, 1988; Rothblum, 1990b; Rothblum, Solomon, & Murakami, 1986; Solomon & Rothblum, 1984, 1988). As a result of this research, a model has been developed that conceptualizes fear of

failure as an avoidance process (Solomon & Rothblum, 1983, in Rothblum, 1990b). Research on fear of failure and achievement-related behavior among members of ethnic minority groups in the U.S. (Clark & Hill, 1993; Green, 1982) and in Western nations such as Canada (Lay, 1986), Australia (Beswick, Rothblum, & Mann, 1988; Thompson, 1993), and Israel (Milgram, Sroloff, & Rosenbaum, in press) has found similar results.

Whereas women experience greater levels of fear of failure than men, men predominate in risk-taking (Solomon & Rothblum, 1984). In the achievement motivation literature, risk-taking is described as the converse of *fear of failure* (Rothblum, 1990b). Much of the research on risk-taking has focused on dangerous or unhealthy behaviors (destructive risk-taking) among men (e.g., parachute jumping, military combat, dangerous driving, unsafe pedestrian behavior, drug use). The purpose of many of these studies was to find ways to increase safety and health (and thus decrease risk-taking) of participants. There has been little research on risk-taking that does not have dangerous consequences (constructive risk-taking). Given the prevalence of fear of failure among women, an understanding of constructive risk-taking would have important implications for clinical interventions of fear of failure, as well as for prevention of avoidance behaviors in women.

Yet there has been little research on risk-taking with female samples. Most of the existing research on this topic has focused on college students. In one such study, college women who scored high on adventurousness were more willing to take risks and were more independent than were college women low on adventurousness (Douce & Hansen, 1988). Research with Black female college students has found that women with nontraditional career aspirations were higher on risk-taking and on delay of gratification, and lower on fear of success than were women with more traditional career aspirations (Thomas, 1983). A study that asked women about their major regrets and priorities in life (Metha, Kinnier, & McWhirter, 1989) found that the women least satisfied with their lives more often regretted not having taken more risks and having missed educational opportunities than the women most satisfied with their lives.

The present study focused on studying women's willingness to take risks, given that the focus to date has primarily been on women's fear of failure, or need to "play it safe" in order to avoid the possibility of failure. We examined risk-taking among women in the Antarctic, because of the nature of the Antarctic as a contained and physically hostile environment. Some aspects of the Antarctic (e.g., the cold

temperature, blizzards, travelling in poorly marked terrain) constitute *physical risks*. Physical aspects of the Antarctic, as well as accidents that occur as the result of physical risks, are often publicized by the media. Other aspects of going to the Antarctic could be termed *nonphysical risks*; these include the isolation of some Antarctic stations, the distance from the home environment, and the impact of being away on relationships back home (Bechtel & Berning, 1991; Carrere, Evans, & Stokols, 1991; Cornelius, 1991; Palinkas, 1991). As Blair (1991) and Oliver (1991) have portrayed, even in the largest and most comfortable Antarctic station during the summer months, people are generally required to share dorm rooms, work in crowded conditions, and seek permission before leaving the station's premises. During the winter, stations are isolated and communication with home is limited (Oliver, 1991). The present study focused on how elements of the Antarctic experience were perceived as risks by women in the sample before they went and once they were in the Antarctic. We wanted to understand what factors motivated women to go to the Antarctic, what they perceived as gains and losses as a result of the experience, and whether they would go back.

The Social Consequences of Risk-taking

The literature on fear of failure indicates that what women regard as fearful about failure is the expected negative interpersonal consequences (such as fear of rejection) rather than poor performance on a task (see Rothblum, 1990b, for a review of this literature). Whereas men are socialized to value intelligence and leadership, women are expected to develop social skills and avoid social rejection. Consequently, men use competitive strategies whereas women use accommodative strategies that incorporate the welfare of others (Rothblum, 1990b).

Given the importance of social relationships for women, and the perceived negative social consequences of fear of failure, it is understandable why women avoid risk-taking situations. Thus, it is of interest to examine how women who *have* taken risks have coped with the potential social consequences of these actions; this was the second goal of the present study. How did social factors influence women's decisions to seek Antarctic duty? Were women's social supports (friends, family members, and coworkers) supportive or unsupportive of the women's plans to go to the Antarctic? If social supports were unsupportive, but the women left anyway for the

Antarctic, are these women less affected by social relations? Given that expected negative social factors are a major barrier for women high on fear of failure, the present study was able to provide information on how women presumed high on risk-taking reacted to these social consequences.

METHOD

Subjects and Procedure

The goal of the study was to contact women who had been in the Antarctic as part of the U.S. Antarctic Program (USAP) during the 1990/1991 and/or the 1991/1992 Antarctic seasons, and who were interested in being interviewed for our study. Specifically, we wanted to interview 14 women from each of the three groups that constitute the USAP. This sample size was considered small enough to permit analysis of lengthy and in-depth qualitative interviews within the time constraints of the one-year funding period, but large enough to allow some diversity of women's ages and Antarctic experiences (e.g., number of seasons in the Antarctic).

The first group, scientists, apply for Antarctic duty through the National Science Foundation (NSF); the primary reason that the USAP funds Antarctic stations is for research in such disciplines as meteorology, geology, oceanography, marine biology, and astrophysics. The number of women scientists and scientific support staff (e.g., principle investigators, laboratory assistants, student assistants) has increased dramatically from 43 in the 1979/1980 Antarctic season to over 180 in the 1990/1991 season (Nadine Kennedy, NSF, personal communication, March 1991).

The second group are U.S. Naval personnel. The Navy transports scientists and civilians to the Antarctic and is in charge of the three U.S. Antarctic stations. Each Antarctic season, about 800 enlisted personnel of the Naval Support Force Antarctica (NSFA) are in the Antarctic, and about one quarter (200) of these are women (LCDR Maggie Reed, personal communication, April 1991). Furthermore, each Antarctic season, about 25 female officers of the VXE6 air squadron receive Antarctic duty as flight crew.

The third group consists of personnel hired by Antarctic Support Associates (ASA). ASA is the current contractor to the USAP. The majority of civilian support staff are construction workers, field engineers, materials persons, clerks, and general assistants. Other ASA

job descriptions include administrative assistants, facilities maintenance personnel, power plant personnel, garage personnel, communications personnel, and computer personnel (NSF, 1988-1989). In the 1990/1991 Antarctic season, 422 people (95 women) were employed by ASA in the Antarctic, and 218 spent the winter season in the Antarctic (37 women). Thus, about 26 percent of ASA staff are female (Debbie Norris, Personnel Division, ASA, personal communication, April 1991).

Two hundred letters were sent to the personnel division of ASA and the administrative division of the NSFA, respectively. They in turn applied address labels of women (selected at random) who had been to the Antarctic during the appropriate seasons. This was to ensure that the research team would only be aware of the names of those willing to participate in the study.

The names and addresses of scientists who are awarded grants from the National Science Foundation are a matter of public record (USAP Science Program Plan 1990-1991; 1991-1992). The principal investigator of all science teams that included either female or gender-neutral first names was contacted by a letter requesting the names and addresses of field team members. All field team members (including principal investigators) with female or gender-neutral first names were sent a letter inviting them to be interviewed for the study; this consisted of 50 women.

All potential subjects were sent a brief letter explaining the nature of the research and requesting volunteers to be interviewed. The letter stated that the research involved human experiences in the Antarctic; potential subjects were not informed that the research would focus specifically on women. Those interested in being interviewed returned a form in a pre-addressed envelope; the form requested their name, address, telephone number, age(s) while in the Antarctic, dates in the Antarctic, and season(s) spent in the Antarctic.

Because no previous research had been conducted specifically on women in the Antarctic, we wanted to know how representative our female sample would be with a similar male sample in terms of response rate. In order to compare women's willingness to be interviewed for the study with that of men, letters were sent to similar numbers of men (i.e., 200 in the Navy, 200 from ASA, and 50 from NSF). Men were contacted by the same methods as were women.

The response rate of willingness to participate was 94 (47%) from ASA women versus 65 (32%) from ASA men. Response rate from Navy personnel was 28 (14%) for women and 30 (15%) for men.

Response rate from NSF scientists and scientific support staff was 36 (72%) for women and 27 (54%) for men. The differences in response rate by recruitment group was partly determined by availability. Most scientists and scientific support staff who had been to the Antarctic were in the U.S. at the time they received the letter. Navy personnel are generally expected to deploy to the Antarctic for three consecutive years. Consequently, most Navy personnel were back in the Antarctic at the time of the survey. Some ASA personnel were back in the Antarctic as well. In general, response rate of women for this study was equal to or higher than that of men. Thus, the samples of women who responded, even when low, were not lower (and often higher) than comparable samples of men.

Thirty-six women who had been in the Antarctic during the 1990/1991 and/or the 1991/1992 Antarctic seasons participated in the study. We selected 14 women from each group who responded and who were available to be interviewed. Fourteen women from the science group and from ASA, respectively, were interviewed. Only eight participants were women Navy personnel, due to the number of women (even among those who expressed willingness to be interviewed) who left for the Antarctic or other assignments overseas before an interview could be scheduled. Participants who were available to be interviewed were contacted by telephone, and an interview time was arranged. Ten women were interviewed in person; 26 over the telephone. The interviews were about one to three hours in length. Participants who were not available or not selected to be interviewed were sent a letter thanking them for their willingness to participate in the study (no men were interviewed for this study).

Demographic information of participants is presented in Table 1. Participants' ages ranged from 20 to 57, with a mean of 33.7 years. A one-way analysis of variance indicated no significant age difference between groups. About half the women had spouses or partners and about one-quarter had children. Women with children had from one to six children, who ranged in age (while the women were in the Antarctic) from six weeks old to adults. Most women had lived at McMurdo Station, the largest Antarctic station, with small percentages at the coastal Palmer Station, the station at the geographic south pole, field research camps, or on research ships. Over ninety percent of

Table 1
Demographic Information About Women in the Antarctic

| Characteristic | Group | | | |
|---|---------------|--------------------|-------------|-------------|
| | Total N=36 | Scientists N=14 | Navy N=8 | ASA N=14 |
| Age range | 20-57 | 20-49 | 23-38 | 21-52 |
| Mean age | 33.7 | 34.0 | 28.9 | 36.1 |
| Had spouse/partner | 21 (58%) | 12 (86%) | 3 (36%) | 6 (43%) |
| Had children | 10 (27%) | 4 (29%) | 2 (25%) | 4 (29%) |
| Antarctic station: ^a | | | | |
| McMurdo | 29 (80%) | 7 (50%) | 8 (100%) | 14 (100%) |
| Palmer | 5 (14%) | 4 (28%) | 0 (0%) | 1 (7%) |
| South Pole | 3 (8%) | 1 (7%) | 0 (0%) | 2 (14%) |
| Field camp | 6 (17%) | 3 (21%) | 2 (25%) | 1 (7%) |
| On ship | 4 (11%) | 4 (28%) | 0 (0%) | 0 (0%) |
| Seasons: ^b | | | | |
| summer | 34 (94%) | 13 (93%) | 8 (100%) | 13 (93%) |
| winter | 5 (14%) | 0 (0%) | 0 (0%) | 5 (36%) |
| win-fly ^{c,c} | 13 (36%) | 3 (21%) | 3 (38%) | 7 (50%) |
| Number of times in Antarctic: | | | | |
| Once | 18 (50%) | 7 (50%) | 3 (38%) | 8 (57%) |
| Twice | 9 (25%) | 4 (28%) | 2 (25%) | 3 (21%) |
| Three times or more | 9 (25%) | 3 (21%) | 3 (38%) | 3 (21%) |
| Mean time length in Antarctic (months) | | | 6 | 7 |

Total > 100% because some women were at more than one station or came for a combination of seasons

^{c,c} Refers to the first flights in at the end of the winter

women had been in the Antarctic during the austral summer. Most scientists and Navy personnel leave the Antarctic during the austral winter, and stations are staffed by a small number of ASA personnel. About one-third of ASA women in the current study had spent a winter in the Antarctic. About one-third of participants had flown in on the first flights after the winter. One half the participants had been to the Antarctic once, one quarter twice, and one quarter three times or more. On average, the duration of stay had been five months.

Measures

Data were collected using a qualitative research methodology. The purpose of qualitative research is to increase one's understanding and interpretation of how research participants construct the world around them (see Denzin, 1978; Lincoln & Guba, 1985, for reviews). Study designs generally focus on in-depth interaction with relevant people in one or several sites. The researcher becomes the main research instrument as she observes, asks questions, and interacts with research participants. Because of the open-ended, more holistic nature of qualitative inquiry, it may attend to that which quantitative research is likely to not see or to ignore. It is frequently used for pilot research when there is little prior information on a topic area or population (Lincoln & Guba, 1985), and has been a common method of collecting data in the Antarctic (e.g., Oliver, 1991). Its goal is understanding and, frequently, hypothesis generation for future research.

In the present study, use of qualitative techniques reflects the belief that understanding women's experiences in the Antarctic is best gleaned through reflections, viewpoints, and experiences of the women who resided there. A semi-structured, open-ended interview was developed that focused on the following components:

1. *Risk-taking.* Participants were asked (1) whether any aspect of going to the Antarctic felt risky; and (2) what kinds of risks they took while in the Antarctic. Risk-taking was also assessed indirectly with the two questions: (1) What motives they had for going to the Antarctic (What led up to the women going to the Antarctic; how they ended up going); and (2) Whether they viewed going to the Antarctic as an adventure. In order to assess the perceived outcome of the Antarctic experience as positive or negative, women were also asked what they felt they gained or lost from going to the Antarctic and whether they would go back.

2. *Social consequences.* Participants were asked about people's reactions when they found out that the women were going to the Antarctic. We focused on how family, friends, and coworkers reacted, how supportive they were, and whether their reaction was a surprise to the women. The purpose of this category was to determine whether the social consequences of making the decision to go to the Antarctic were positive or negative.

RESULTS

The interview data obtained in this manner were audiotaped, transcribed, and entered into a computerized data management program called *Ethnograph*. This program provides a means to sort and re-sort data efficiently by code words assigned by the researchers. The interview data were analyzed for themes and patterns by the second author for each of the major interview categories (e.g., social consequences) and these were (1) further coded into subthemes (e.g., positive and negative social support from family, friends, and coworkers); and (2) examined separately by job category of participant (i.e., scientists, navy personnel, and ASA personnel). Frequencies of responses that categorized all major themes and subthemes are presented in Table 2.

Reliability of coding categories

A sample of six interviews (17%) was double-coded; interrater agreement was assessed for the five major categories (risk-taking before going to the Antarctic, risk-taking while in the Antarctic, motivation for going, viewing the experience as an adventure, and social consequences). Cohen's Kappa was very high ($\kappa = .89$). In addition, percent agreement for the major coding categories were as follows: 92 percent for risks before going to the Antarctic; 100 percent for risks while in the Antarctic; 83 percent for motivation for going to the Antarctic; 89 percent for viewing the Antarctic experience as an adventure; and 92 percent for social consequences of the decision to go to the Antarctic.

A copy of the interview questions can be obtained from the first author.

Table 2
Percentage of Women who Responded to Themes
of Risk-taking and Social Support

| Theme | Group | | | |
|---|---------------|--------------------|-------------|-------------|
| | Total N=36 | Scientists N=14 | Navy N=8 | ASA N=14 |
| RISK-TAKING | | | | |
| <i>Perceptions of risk before going to the Antarctic:</i> | | | | |
| Mentioned only factors that were not risks | 25% | 21% | 50% | 14% |
| Not a risk: Total | 69% | 57% | 75% | 78% |
| Not a risk because: Exciting | 25% | 21% | 12% | 36% |
| Didn't know what to expect | 11% | 7% | 38% | 0% |
| Interpersonal supports | 14% | 14% | 12% | 14% |
| Other reasons | 33% | 21% | 50% | 36% |
| Knew people in similar situations | 14% | 21% | 12% | 7% |
| Had been in similar situation | 25% | 28% | 25% | 21% |
| Mentioned only factors that were risks | 25% | 43% | 12% | 14% |
| Was a risk: Total | 72% | 78% | 38% | 78% |
| Was a risk because: | | | | |
| Leaving family/home | 36% | 43% | 38% | 21% |
| Lack of communication with home | 8% | 0% | 25% | 14% |
| Negative reactions of others | 8% | 7% | 12% | 7% |
| Other people in the Antarctic | 17% | 14% | 0% | 28% |
| Travel to or in the Antarctic | 30% | 36% | 25% | 28% |
| Weather in the Antarctic | 17% | 28% | 0% | 14% |
| Practical concerns | 17% | 14% | 12% | 21% |
| Work/leaving stable job | 11% | 0% | 0% | 28% |
| Fear of dying | 11% | 21% | 12% | 0% |
| Medical reasons | 6% | 7% | 12% | 0% |
| Fear of the unknown | 6% | 0% | 12% | 7% |
| Negative emotions, loss of control | 22% | 14% | 12% | 36% |
| Nothing was a risk | 3% | 7% | 0% | 0% |
| Some aspects were a risk | 80% | 93% | 75% | 71% |
| Was a risk because: Exploring/trips | 33% | 36% | 38% | 28% |
| Travel to or in the Antarctic | 30% | 28% | 12% | 28% |
| Relationships | 11% | 7% | 0% | 21% |
| Work | 11% | 21% | 0% | 7% |
| Health | 8% | 14% | 0% | 7% |
| Risk happened to other people | 14% | 7% | 38% | 7% |
| Knew the risks and avoided them | 19% | 21% | 38% | 7% |

Table 2 (continued)

| Theme | Total N = 36 | Group | | ASA N = 14 |
|---|-----------------|----------------------|---------------|---------------|
| | | Scientists N = 14 | Navy N = 8 | |
| Ant. program focused on safety | 30% | 42% | 25% | 21% |
| Should have been more worried beforehand | 8% | 14% | 12% | 0% |
| <i>Motivation for going to the Antarctic</i> | | | | |
| Work advancement | 42% | 64% | 62% | 7% |
| Part of the job | 11% | 14% | 25% | 0% |
| Get out of current job | 11% | 14% | 0% | 14% |
| Get out of relationship | 6% | 0% | 0% | 14% |
| Improving current relationship | 3% | 0% | 12% | 0% |
| Children grown up | 6% | 0% | 0% | 14% |
| Doing something exciting, extraordinary | 22% | 0% | 12% | 50% |
| Grabbed the opportunity, said yes at once | 11% | 0% | 0% | 28% |
| Knew someone, had connections to Ant. job | 28% | 43% | 0% | 28% |
| Were hesitant, needed encouragement | 8% | 7% | 0% | 14% |
| <i>The Antarctic experience as an adventure</i> | | | | |
| Was an adventure | 75% | 50% | 75% | 93% |
| Was not an adventure, mixed reaction | 28% | 50% | 25% | 7% |
| <i>Adventurous person:</i> | | | | |
| Travel arena | 25% | 28% | 12% | 28% |
| Interpersonal arena | 8% | 0% | 0% | 21% |
| Other arenas | 22% | 7% | 24% | 36% |
| Not an adventurous person | 39% | 57% | 50% | 21% |
| Others regard me as adventurous | 11% | 14% | 12% | 7% |
| <i>Gained from going to the Antarctic</i> | | | | |
| Personality changes, personal growth | 67% | 57% | 75% | 71% |
| Specific skills, job/career skills | 42% | 57% | 38% | 28% |
| Having an "experience" | 58% | 78% | 12% | 64% |
| Friendships, people | 42% | 50% | 62% | 21% |
| <i>Lost, gave up, from going to the Antarctic</i> | | | | |
| Nothing was lost | 30% | 43% | 24% | 21% |
| Work, career, school | 50% | 64% | 12% | 57% |
| Family and friends | 25% | 21% | 38% | 21% |

Table 2 (continued)

| Theme | Total N = 36 | Group | | ASA N = 14 |
|--|-----------------|----------------------|---------------|---------------|
| | | Scientists N = 14 | Navy N = 8 | |
| Romantic relationships | 17% | 21% | 24% | 7% |
| Living a normal life | 17% | 14% | 0% | 28% |
| Other, trivial | 19% | 21% | 12% | 21% |
| <i>Would go back:</i> | | | | |
| Interpersonal reasons | 19% | 28% | 12% | 14% |
| Non-interpersonal or no specific reason | 67% | 64% | 50% | 78% |
| <i>Would not go back:</i> | | | | |
| Interpersonal reasons | 6% | 0% | 25% | 0% |
| Non-interpersonal or no specific reason | 11% | 7% | 12% | 14% |
| SOCIAL CONSEQUENCES | | | | |
| Family positive | 75% | 78% | 88% | 57% |
| Family negative or ambivalent | 50% | 36% | 50% | 50% |
| Friends positive | 25% | 21% | 0% | 43% |
| Friends negative or ambivalent | 30% | 21% | 24% | 43% |
| Coworkers positive | 17% | 7% | 12% | 28% |
| Coworkers negative | 11% | 7% | 12% | 14% |
| Didn't have friends; friends not important | 8% | 0% | 25% | 7% |
| Not surprised by the reactions of others | 44% | 64% | 50% | 21% |

RISK-TAKING

Perceived Risks Before Going to the Antarctic

Going to the Antarctic was not perceived as a risk. In response to the question about whether anything about going to the Antarctic was perceived as a risk, one-quarter of the sample (including half the sample of Navy women) mentioned only factors that were not risks. A total of 69 percent of women gave one or more reasons why going to the Antarctic was not perceived as a risk (this included women who

also gave reasons why going to the Antarctic was a risk). One quarter said they were excited about going. For example, the women stated: "No, I'll try anything," "I wanted to fight my way out of my cocoon and discover." Some women indicated that going to the Antarctic was not a risk because they did not know what to expect: "I was remarkably ignorant," "To me, the Antarctic was just another place, like going to New Jersey or going to Europe. It's not like 'Oh my God, it's cold down there. The sun always stays out; there's no shopping malls or restaurants.' I mean none of that ever even dawned on me." Some women cited interpersonal reasons, such as supportive friends or partners. One-third of the sample stated other reasons why the Antarctic was not a risk for them. Interestingly, some of these comments compared the Antarctic with other, more dangerous activities, so that the Antarctic was perceived as relatively safe in comparison. Comments such as these included: "Not like the Arctic, where you could be eaten by a polar bear," "Not like being sick really bad," "Not like going to a war zone that has real dangers."

Some women stated that people they knew, including family members, friends, or colleagues, had been in similar or riskier situations, so that the Antarctic experience was familiar to them. One-quarter of the women had themselves been in similar situations to the Antarctic. For example: "I had travelled to other strange places by myself," "I had been on research cruises on the ocean," "I'm a technical rock climber," "I work in a lot of dangerous situations."

Going to the Antarctic was perceived as a risk. As Table 2 indicates, in response to the question about whether anything about going to the Antarctic was perceived as a risk, one-quarter of the sample (including 43 percent of scientists) mentioned only factors that were risks. Seventy-two percent of women mentioned one or more specific risks involved in going to the Antarctic (including women who had mentioned factors that were not risks, above). Some of the categories of risks were interpersonal in content. Risks related to family and friends included leaving husbands, children, and other family members, fearing that someone back home might die, or not having left home before. Some women thought the lack of communication with home was a risk. Women mentioned worrying about the reactions of others (e.g., children) as a risk, or other interpersonal risks, such as not getting along with people in the Antarctic or not knowing anyone.

Other categories of risk were not interpersonal. About one-third of the sample was concerned about the risks of travelling to the Antarctic

or in the Antarctic; several had never flown or been out to sea before. Women mentioned the weather in the Antarctic, practical concerns (depositing checks, missing school, living in a dorm), work (primarily leaving a stable job for the unknown), dying, medical reasons, fear of the unknown, and negative emotions (e.g., depression, loss of control).

Perceived Risks While in the Antarctic

The women generally did not perceive the Antarctic to be a risk beforehand, but this changed once they were on the ice. Only one woman (a scientist) indicated that there was nothing risky about being in the Antarctic. Her comment: "It's not like you're trying to climb Mt. Everest," again indicates the tendency of the women to compare their experiences to even more dangerous or adventurous situations.

Most women (80%) mentioned some aspects of the Antarctic experience as risky. About one-third of the sample described risks related to exploring or going out on day trips. Their comments included unauthorized exploring, being caught in storms, being lost, getting frostbite, or coming too close to crevasses, icebergs, or leopard seals. Approximately one-third mentioned risks related to travelling to the Antarctic or within the Antarctic. These women were aware that accidents did occasionally happen to planes, helicopters, or ships (one helicopter crashed during the time when women were being interviewed). Other comments included fuel leaks on ships, landing in bad weather or on the ice runways, and being on a ship in a storm. Women brought up risks related to relationships in Antarctica as well as relationships with people back home (e.g., initiating and terminating romantic involvements, friends leaving), work (e.g., collecting data in poor weather conditions), health, and risks that happened to others. In addition to these accidental risks, two women indicated that they purposely took risks (because of boredom or trying to have an accident in order to be shipped back home).

Because they knew that the Antarctic environment could pose risks, the women tried not to engage in activities that might be dangerous. About one-third of participants emphasized that the USAP made every effort to reduce risks, so that they felt protected. A few women said they realized when they got to the Antarctic that they should have been more worried than they were beforehand.

Motivations for Going to the Antarctic

The most frequently cited reason for going to the Antarctic was work-related, specifically career advancement. Forty-two percent of the women said they went for job advancement or a job opportunity. This was true for over 60 percent of scientists and Navy women, but for only 1 ASA woman. Other women went because it was "part of the job," but was not for job advancement, or they went as a way to get out of their current job.

Another motivation for seeking Antarctic duty was related to relationships. Two women (both ASA) went to the Antarctic as a way of getting out of a bad relationship, and one woman (Navy) went as a way of staying more connected to her family than if she went elsewhere. Two ASA women said they went because they had the freedom to travel now that their children had grown up.

Third, women wanted to go to the Antarctic in order to do something enlivening or different. Half of the ASA sample stated that they wanted to do something exciting or extraordinary. All the women who mentioned that they grabbed the opportunity as soon as it was offered and said yes immediately were from the ASA sample. About one-quarter of the total sample knew someone who had been to the Antarctic, and that person's excitement, encouragement, or connections to jobs in the Antarctic was why they went. Three women were hesitant, and needed some encouragement to go.

Women's comments often illustrate a combination of motives, as well as the enthusiasm for adventure and opportunity: "I never planned on going to the Antarctic. When there was an opportunity, I was very excited, no trepidation at all. There's a credibility gap in my job if you haven't been," "Never really had left my state, and it was exciting to think about travel. Flew in in one of the worst conditions, but when I got there I loved it," "I was out of work and the woman at Job Service said 'Do you want to work on the ice?' And I said 'Excuse me?' And I had been to Alaska and loved it there and I said, 'Where do I sign up?' I had about one week's preparation, but I didn't care. Anything to get me there."

The Antarctic Experience as an Adventure

The majority of women did consider the experience to be an adventure. This ranged from half the scientists to three-quarters of the Navy women and nearly all the ASA women. Women mentioned

the exciting opportunity, the beautiful scenery, the fact that few can go there, and the fact that they had never left home before.

About one-quarter of the women did not regard the Antarctic experience as an adventure, or had mixed feelings. Scientists in particular (half the sample) were reluctant to call it an adventure. They tended to focus on the career advancement and the ability to get work done: "I saw it really as an opportunity to get some practical work done in the field.... Maybe if I'd just gone down there and been able to fly around and take lots of pictures and visit the historic sights, I would have considered that more of an adventure." Some women seemed to equate adventurousness with dangerousness, and often compared the Antarctic experience with real danger (so that it paled in comparison): "I guess I didn't really see it as any more risky than doing anything else, so I didn't see it as dangerous."

Separately from their perceptions of the Antarctic experience as an adventure, a number of women viewed themselves as adventurous. To demonstrate their adventurousness across the years, they mentioned other adventures in interpersonal relations ("I started dating a man that lived in California and on the drop of a dime we'd meet in another state. Distance to me is something to get over; it's not something to let you stop"), travel ("Going...below the surface of the ocean, I consider pretty adventuresome"), or other arenas ("When I was 16, I went and applied to a rescue squad. And being, first of all, 16, being female, being small, and them saying, 'You're never going to be able to lift this thing' and I was like, 'watch me' and just doing that all my life, of jumping in, figuring out how to either go around the system or get through it in whatever way, and then having success at that"). About half the scientists and Navy women said they did not view themselves as adventurous, but this was true of only 3 ASA women. A few women said that other people see them as adventurous: "When I joined the Army, all I heard from my parents was, 'If anyone would do it, figures you'd be the one.'"

Gains and Losses as the Result of the Antarctic Experience

One of the interview questions focused on what the women felt they had gained and what they had lost as the result of going to the Antarctic. Most women felt that they had both gained and lost from their experiences in the Antarctic. In terms of gains, most women (including half the scientists and three-quarters of the Navy and ASA women) felt they had gained personal growth, particularly in self-

reliance and independence. Comments included: "I always tended to think of myself as very much afraid to venture off the straight and narrow. I don't think I have quite that fear of doing that again," "I learned that I can overcome any obstacle without anybody helping me. I learned that I can do, I can succeed only if I want to and if I have the willpower to do it."

Women also felt they had acquired specific skills (e.g., valuable experience for their job, leadership skills). About half the sample (including three-quarters of scientists but only one Navy woman) said they had "had an experience," they were one of the few people who could say they had been to the Antarctic, or they saw beautiful sights. Half the scientists and Navy women (but fewer ASA women) indicated that they had gained friendships and learned a lot about people.

In terms of losses, about half the sample felt that they lost job opportunities or education (this was not the case for Navy women, for whom the Antarctic was typically a form of career advancement). Women also indicated that they gave up romantic relationships (boyfriend, marriage) or the ability to "live a normal life." Finally, women mentioned trivial issues (e.g., not being able to play soccer, not having a newspaper), which indicated that they could not think of many important losses. Nearly one-third of the sample stated that there were no losses at all. For example: "I don't regret going one little bit," "There wasn't really much for me to give up. I'm a single woman, so you just pack up and go."

The majority of women stated that they would go back to the Antarctic. Some women (19%) said they would go back for interpersonal reasons, but the majority (67%) mentioned noninterpersonal reasons, such as the science or the scenery. Not many women indicated that they would not go back, but those that did mentioned the physical deprivations or the lack of contact with family.

SOCIAL CONSEQUENCES

Support from Family

As Table 2 indicates, the large majority of women (75%) indicated that some or all family members reacted positively to the women's decision to go to the Antarctic. This was the case for over three-quarters of scientists and Navy women, and about half the ASA women. Comments reflected the positive feelings of a number of

family members: "My dad was excited, I'm the only one of his kids who's a risk-taker," "Parents were thrilled, thought it was great that their daughter was going down there," "My grandmother said if she were younger, she would go and do that. She's in her 80s and arthritic, but she studied chemistry in the 1920s. She's pretty progressive and she kind of installed that in me more than anybody," "My mother thought it was neat and my husband thought it was great," "They reacted 100 percent with excitement," "I'd gone back to school after my children were born, so they were accustomed to my doing something," "My daughter was ecstatic. My son was excited and the other son thought it was cool. My mother is 80 and in a nursing home. She said 'Go for it.'"

At the same time, half the women reported reactions by other family members that were ambivalent or negative. This occurred to half the Navy and ASA women, but to fewer scientists. Forty-four percent of the women indicated that the family member with negative reactions was their mother: "My mom thinks half the stuff I do in the military is too risky," "My mother (who died while I was on the ice) was always very negative towards things like that 'Oh, when are you going to become a lady?' But then she told all her friends and it became a status thing," "My mom almost died. She's a real worrier," "Mom was apprehensive, but knew it was an opportunity," "My mom wanted to know what would happen to our phone calls--we talk at least three times a day," "Mom was worried, concerned about my flight down and how I was going to mentally and physically hold up to it." Women also mentioned mixed or negative reactions from other family members: "Three children said that sounds great and three children said, 'You're going where?'" "My family wished I wouldn't leave, they were concerned about my son."

Support from Friends

About one-quarter of the women (but no Navy women) mentioned positive support from friends. Friends who were supportive tended to focus on the excitement and adventurousness of the trip: "My friends said: 'Well, she's off on another adventure,'" "I've had negative reactions from friends about other things, but everyone thought this was great," "My neighbor who lives underneath me said, 'Do it. If you have the chance, do it.'"

Slightly more women (30%) indicated that friends reacted with ambivalence or were negative. Friends who were negative often

thought the women were crazy: "Some friends said, 'All right! Go for it!' and others said 'Are you crazy? Don't you realize?'" "Most of them thought it was pretty unbelievable that I would sell my company, leave the farm and leave my daughter and get on a plane and leave," "People thought I was a little bit insane because I volunteered to deploy. I went directly from Hawaii to Antarctica and they said: 'You're leaving paradise for this?'" Some friends focused on the fact that the women were abandoning them: "Friends were upset because I wouldn't be graduating with them," "My girlfriend went through a divorce and it was hard because I wasn't there. She never forgave me for that." ASA women had the highest percentages of positive and negative reactions from friends; Navy women mentioned friends the least.

Women didn't have friends or friends were not important. A few women indicated that they didn't have a lot of friends ("I don't really have friends; have moved around a lot in the Navy") or that reactions of friends were not important to them ("I had the approval of my husband and my career manager, and no one else's approval meant anything"). Obviously, not having friends or close friends means that reactions of friends are not important in the decision to leave for the Antarctic.

Support from Coworkers

Six women (17%), including 4 ASA women (28%), 1 Navy woman, and one scientist, mentioned support from coworkers. Comments included emotional support ("A coworker was very comforting during the stress of the final days") and tangible support ("The manager's daughter was helpful in telling me what to take"). Four women (11%) stated that coworkers were unsupportive of their going to the Antarctic.

Surprise by Reactions of Others

About half the scientists and Navy women said that they were not surprised by people's reactions. These women indicated that people knew them well, and knew they did unusual things: "My husband is a scientist also and my parents have always been supportive of whatever weird things I've decided to take on." In most cases, women who were surprised had expected a negative reaction and received a positive one ("I was pleasantly surprised that my mother

was happy from the outset"). Finally, two women indicated that they reassured people who had negative reactions ("Like for my sister, I said: 'Here's the fax number. When you have the baby, fax it to them and they'll fax it to me'"). Two women indicated that, in order to avoid negative reactions, they just did not tell anyone: "I just make the decision and tell people afterwards. That's just the way I am," "No one talked me out of it because I didn't tell anybody. I waited until everything was set and then I said, 'Could you pick up my mail?'"

DISCUSSION

Risk-taking

The results indicate that women who have gone to the Antarctic have participated in many unusual activities and often travelled widely. Thus, for many women, going to the Antarctic was only one in a series of adventures. They did not consider the Antarctic a risk because they knew people who had been there and spoke about it with enthusiasm, or because they themselves had been to other polar regions, remote locations, or on long trips. For most women, going to the Antarctic was an experience they did not regret. They felt they had gained more than had lost by going, and would be willing to go back. The women in this sample are thus markedly different from the large literature that has found women in the general U.S. population to be low on risk-taking (Rothblum, 1990b; Rothblum & Cole, 1988).

In this regard, women who have been to the Antarctic are similar to men. Suedfeld (1991a) found newcomers to the Antarctic to score high on the Sensation Seeking Scale (Zuckerman, 1979), a scale that is often used to assess risk-taking. Antarctic veterans did not score high on this measure. Leon (1989) did not find high risk-taking among a North Pole expedition team, but this group, too, consisted of veteran explorers. It is possible that women who go to the Antarctic are relative newcomers to this environment.

The women scientists, Navy personnel, and ASA employees differed in their motivation for going to the Antarctic. Nearly two-thirds of scientists and Navy personnel considered the Antarctic a means of career advancement, compared with only 1 ASA woman. Navy women's comments emphasized the special nature of Antarctic duty: because it was a noncombat deployment, it provided an opportunity for women to gain promotions (since women at the time could not be deployed in combat situations). ASA women, on the

other hand, applied for jobs in the Antarctic out of a spirit of adventure and in order to do something unusual. ASA women were the ones most likely to have given up comfortable jobs for the thrill of the Antarctic experience. Both adventure and career advancement have been found to be primary motivations of why men seek Antarctic duty as well (Leon, 1991a; Natani & Shurley, 1974).

Before going to the Antarctic, one-quarter of the sample did not perceive any aspect of the trip as risky. This was particularly true for women in the Navy, where half the sample indicated that nothing was considered a risk beforehand (several Navy women stated that the "Navy would not send you anywhere that was unsafe"). The issues that women considered to be risks before they went included a number of physical risks (travel, weather) as well as nonphysical risks (leaving family, communicating with people back home, getting along with people in the Antarctic).

There was quite a discrepancy between what women thought would be risky about the Antarctic beforehand and what actually occurred when they were on the ice. Nearly everyone agreed that once they were in the Antarctic, they did experience some risks or else they were aware of the risks and tried to avoid them. Few women considered interpersonal factors to be risks in the Antarctic, including factors related to the home environment. Nearly two-thirds of the risks mentioned by women were physical risks, mainly travel and exploring. Many of the risks associated with exploring and trips (mentioned by about one-third of the sample) occurred during leisure time and thus might have been avoidable by fearful individuals. The discrepancy between perceived risks before and actual risks during the Antarctic experience may suggest that women were more concerned with family and home support issues while they were in the process of leaving these sources of support but not once they had left. It is also possible that women who go to the Antarctic cope by denying the possibility of physical risks beforehand.

Even though most women considered some aspect of the Antarctic to be a risk, most women said they would go back. This indicates a lack of concern with fear of failure, given that risk-taking has been conceptualized as the opposite of fear of failure (Rothblum, 1990b). Generally, women felt they had gained more than they had lost from the Antarctic experience, and those who experienced losses enjoyed the experience despite the losses. In particular, about half the sample felt they had given up school or compromised their career in going to the Antarctic, in exchange for gains that were primarily personal

growth and/or having an experience shared by few others. This reflects risk-taking more than a tendency to "play it safe."

Social Consequences

It is striking that three-quarters of the sample indicated that at least some family members reacted positively when told that the women were going to the Antarctic. It would be of interest to interview family members for their acceptance of nontraditional roles for women, including risk-taking. On the other hand, about half the women indicated that some family members, often mothers, reacted negatively. How do women possess the resilience to go away even when family members, particularly mothers, are disapproving? Unlike the literature on women and achievement (Rothblum, 1990b) that has found women to accommodate to others rather than risk rejection, the women in this sample were able to focus on their own needs rather than those of others.

Scientists tended to have the best family responses, with the best combination of many enthusiastic and few unenthusiastic family members. Scientists were also the most surprised by the (usually positive) reaction of others. Navy women received no positive responses from friends, but Navy women sometimes did not have friends. Navy women did have the most positive response from family members. It is possible that women such as those who go to the Antarctic place less importance on interpersonal relations than is usually attributed to women. It is presumably easier to leave despite negative comments from family and friends if the women are not deeply connected with these supports. On the other hand, it is possible that the women trusted the social ties they have and thus are able to leave despite negative reactions from others. Further research needs to assess the strength of social ties, in order to examine if reactions from others are important.

The possibility that women who go to the Antarctic do not place a heavy emphasis on social supports, and thus may have the freedom to leave these supports, may differentiate them from women in the general population. There has been a general belief that social support is always positive, and the more social support available, the better the psychological and physical health of the individual. Shumaker and Hill (1991) have reviewed the literature on gender and social support, and conclude that the positive benefits of social supports on health "consistently demonstrate the protective role of support for White

men" (p. 106). Research has demonstrated that women become more involved than do men in the lives of their friends, family, and even distant acquaintances, and thus women's social supports may themselves become sources of stress (Solomon & Rothblum, 1986; Wethington, McLeod, & Kessler, 1987). Furthermore, women are more likely to be approached by others who are undergoing crises, and so women spend more time assisting others and receiving self-disclosure than do men. Consequently, social support has costs as well as benefits for women, a phenomenon that has been termed "the cost of caring" (Wethington et al., 1987). Further research needs to focus on social support among women who assume nontraditional roles.

Leon (1991b; Leon, Kanfer, Hoffman, & Dupre, 1991) found that her sample of mostly male polar explorers rarely engaged in emotional sharing. In fact, those who sought out social support tended to have poorer psychological functioning. Future research should examine women's experiences of social support while on the ice.

Limitations of the Study and Implications for Further Research

This study was limited by the small sample size, particularly of women in the Navy. We were constrained by women's travel schedules, and Navy women in particular tended to spend most of the year in the Antarctic or on other assignments. The study was also retrospective in nature, asking women about their experiences once they had returned from the ice. It would be useful to focus instead on women before their first trip to the Antarctic, in order to compare their perceptions beforehand with those after they return. Further, the study compared only groups of women in the Antarctic, all of whom are nontraditional in risk-taking. It would be interesting to compare women in the Antarctic with men in the Antarctic, and also with women (e.g., women's co-workers, friends) who would not choose to go to the Antarctic. Finally, the small sample did not permit the role of station size in affecting women's Antarctic experiences. However, both Oliver (1991) and Blair (1991) have emphasized that the stress of the Antarctic experience holds true even at the largest station.

Finally, the study focused only on women from the United States, and consequently does not reflect the experiences of women who spend time at Antarctic stations from other countries. Women from other nations may differ in the motivations for going to the Antarctic, in defining the Antarctic as a risk, and in social consequences for their

decision. For example, Argentine Antarctic stations are geographically closer to the home environment and have facilities for families with children (Luis Isuardi, Argentine Antarctic Institute, personal communication, January 1989). The research of Mocellin, Suedfeld, Bernadelz, and Barbarito (1991) with male and female residents of Arctic and Antarctic stations found data on levels of anxiety among Argentine Antarctic residents to differ from those of U.S. Antarctic residents.

The results of the present study imply that women compared the Antarctic experience to even more nontraditional and often riskier situations ("It's not like climbing Mt. Everest"). Presumably, some women who would choose not to go to the Antarctic would compare the Antarctic to less risky situations, such as staying in their home and job. The literature on social comparisons indicates that people are constantly comparing themselves to others (see Suls & Wills, 1991, for a review). In any given situation (e.g., an athletic event), people can compare their performance to those who are worse (downward social comparisons) or better (upward social comparisons). Use of upward social comparisons by people who go to the Antarctic may cause them to normalize the experience by contrasting it with even more atypical or risky situations. It is also possible that people who go to the Antarctic are less likely to use social comparisons because they are less relational in general. The research of Kilduff (1992) has found that people who rely less on social cues and who insist on being themselves made career choices that were dissimilar to those of their friends. On the other hand, people who were very attuned to peer expectations and norms made career choices similar to those of their friends.

The study also indicates that women who go to the Antarctic use denial as a way of avoiding thinking about risks beforehand. Prior research has found denial to be evident in the coping styles of men in the Antarctic. Taylor (1991) found members of the International Biomedical Expedition to the Antarctic to be defensive about reporting their own reactions to stress while at the same time reporting the reactions of other expedition members. Those who did not report stress were also high on repression. Similarly, Rivoirier, Cazes, and McCormick (1991) found Antarctic expedition members to use denial. Miller (1987) has developed a two-factor model to understand the ways in which individuals cope with upcoming naturalistic stressors (e.g., a painful medical procedure). She has found people to differ in information seeking versus information avoidance, as well as in

distraction versus nondistraction. Further research is needed to compare styles of information seeking with risk-taking to examine the relationship between risk-taking and denial/avoidance. It is possible, for example, that information avoidance would correlate with destructive risk-taking (given the impulsive nature of this type of risk-taking) but not constructive risk-taking (which has a more planful and future-oriented component).

What is suggested by the interviews of the women in this sample is that their experiences and behavior do not correspond with research on fear of failure among women in the general U.S. population. Given the socialization of women to place great importance on the possible negative social consequences of risk-taking, the present study indicates that some women are able to overcome (or may never have been shaped by) this socialization. Further research is needed to focus on the lifespan development of risk-taking women.

The results of this study are also applicable to women in other nontraditional roles. As Suedfeld has stated:

"In discussing the effects of 'extreme and unusual environments,'...we quickly realize the difficulty of defining in any general way what such environments are. The frozen ice fields of the Arctic are customary and satisfying to the Inuk hunter.... We view the Arctic as extreme and unusual, but we are really characterizing our view, that is, our experience of the Arctic, not the environment itself" (1991a, p. 139).

In the approaching era of space workstations and interplanetary travel (see Brady & Anderson, 1991, for a discussion of space projects) life in isolated microsocieties will be commonplace for some people. Research on and understanding of women's adjustment in the Antarctic will be of major importance for applicability to group adjustment in space and other confined environments.

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