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Ethnographic and lived experience of cold-water immersion: The compromised survival of women at sea due to ill-fitting immersion suits.

Rosemary Ricciardelli[1,*], Heather Carnahan[1]

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ABSTRACT

Seafarer industries are male-dominated. There are efforts to recruit more women into marine industries. Recognizing the value of immersion suits in preservation of life in the event of abandoning ship, in the current article, we offer an interpretation of personal safety that should be a priority for all women seafarers, employers, and mariner-related organizations; that of personal safety operationalized as the improving probability of survival. Specifically, we draw on our own ethnographic and lived experiences as women in training for ship abandonment in immersion suits and reflect on the emotional and physical labour tied to knowing the suit does not fit correctly. Our purpose is to reflectively provide empirical support for the reality that immersion suits do not fit all women, perhaps not even the majority, and that this means women would be the first to die if they were to abandon ship. Thus, we query, how can women enter the seafarer professions if the equipment does not fit? As authors, our probability for survival would be severely compromised if we ever had to abandon ship at sea in even remotely cold waters. Thus, we provide empirical support for the re-envisioning of immersion suits.

1. Introduction.

The 2015 Manpower Report put forth by the Institute Chapter of Shipping (ICS) and Baltic and International Maritime Council (BIMCO), indicated that a crucial issue affecting the marine sector is a seafarer shortage a challenge estimated to continue until at least 2025. This shortage draws further attention to the push for diversity, equity, and inclusion in, collectively factors underpinning the effort to recruit more women into, seafarer industries (Belcher et al., 2003; Magramo & Eler, 2012; Thomas*, 2004). However, these efforts appear to be far from fruitful (i.e., the shortage may continue past 2025). In 1998, the International Maritime Organization (IMO) reported that women constituted only approximately two percent of seafarers (Belcher et al., 2003). Noteworthy, these two percent included all women on ship, including women in non-operational roles (e.g., kitchen, catering, hotel, cleaning). With a focus on female deck officers and engineers on ship the number decreases tremendously, women here constitute only 0.12 percent of the seafarer population (Drewry & ITF, 2009). Thus, it is without surprise that seafarer industries are recognized as male-dominated (McKay & Lucero-Prisno III, 2012; Turgo, 2021), perhaps in part a result of the priority for strength associated with the occupation (Baum-Talmor & Kitada, 2022; El Husna & Wijinurha, 2020) but also a result of cultural influences and beliefs. For instance, in 1993, researchers have shown, women on board a ship were believed to bring bad luck (Başak, 2015). Moreover, technology increases have also been found to disadvantage women seafarers (Başak, 2015)

In a study of women participating in the Malaysia Maritime Sector, Anuar, Khairi, and Ahmad (2022) found that personal safety, which is a priority for women participants, was compromised by a variety of factors at sea. The authors recognized that women seafarers experience challenges at sea with maternity (see also: MacNeil & Ghosh, 2017), discrimination (see also: Ståhl & Hermansson, 2018), bullying (see also: Pineiro & Kitada, 2020), and harassment, including sexual harassment (see also: Cristina & Luize, 2018), and are concerned about

[1]School of Maritime Studies. Fisheries and Marine Institute. Memorial University of Newfoundland. 155 Ridge Road, St John's, NL A1C 5R3.

*Corresponding author: Rosemary Ricciardelli. E-mail Address: rricciardell@mun.ca.

how each impinges on their personal safety when at sea and thus confined on a vessel. Others, such as Ståhl and Hermansson (2018), have also found that fewer women participate in the maritime industry for reasons that include "lack of knowledge about the profession in general, worse reputation as a workplace, and the complexity of combining family life with a life at sea" (p. i). However, women in their sample also reported harassment and, more concerning, a lack of response from the organization/employer about their complaints (Ståhl & Hermansson, 2018).

Recognizing the value of immersion suits in the preservation of life in the event of abandoning ship, in the current article, we offer an alternative interpretation of personal safety as what should be a priority for all women seafarers, employers, and mariner-related organizations that of personal safety operationalized as the improving the probability of survival. Specifically, we draw on our own ethnographic experiences as women in training for ship abandonment in immersion suits and reflect on the emotional and physical labour tied to knowing the suit does not fit correctly or, as in the case of an author, at all. Our purpose is to reflectively provide empirical support for the reality that immersion suits do not fit all women, perhaps not even the majority, and that this means women would be the first to die if they were to abandon ship. Thus, we query, how can women enter the seafarer professions if the equipment does not fit? As authors, our probability for survival would be severely compromised if we ever had to abandon ship at sea in even remotely cold waters.

2. Survival, Training, and Immersion Suits.

At sea, most accidents are the result of human error (or organizational dysfunction) (Deepwater Horizon Study Group, 2011; Guard, 2010), such errors do and will continue to prevail, thus it is inherently risky to go to sea. For example, the report following the investigation of the BP Deepwater Horizon accident elucidated that human factors impacted individual's performance and decision making during the adverse event (Deepwater Horizon Study Group, 2011; Guard, 2010). Some scholars have examined human factors and the associated challenges in offshore survival (Norafneeza, Anwar, & Arryanie, 2019). The problem is, as Golden and Tipton (2002) write, "a fatality occurs at sea almost every day somewhere in the world" (p. 1). To explain how frequently disasters occur at sea, data between 1985 and 1995 from the United States reveals a total of 204 boat collisions, 769 groundings, 438 "strikings", 211 fires, 131 "sinkings", 38 capsizes, and 18 explosions (Golden & Tipton, 2002). The concern at sea and the direct threat to survival is if the need arises to abandon ship as it is in the water, particularly cold water, that survival can be quickly compromised.

Linked are cold water and drowning, with drowning being a leading cause of death internationally. For instance, speaking about drowning across populations (i.e., not seafarers specifically) Peden and McGee (2003) wrote, nearly 20 years ago, that "According to the GBD [Global Burden of Disease] 2000 data, an estimated 449,000 people drowned worldwide (7.4 per 100,000 population) and a further 1.3 million Disability Adjusted Life Years (DALYs) were lost as a result of premature death or disability from drowning. 97% of drownings occurred in low- and middle-income countries" (p. 195). More recently, Franklin et al. (2020) wrote "Drowning is a leading cause of injury-related mortality globally" drawing on data from 2017 GBD data (p. 183). To ensure the gravity of the situation is recognized, the World Health Organization (WHO) defines drowning as a public health priority, with fatal drowning being a leading cause of unintentional injury-related mortality around the world (van Beeck, Branche, Szpilman, Modell, & Bierens, 2005). Most relevant to abandoning ship, drowning can result from hypothermia (Golden & Tipton, 2002). Prior to hypothermia, when one abandons ship, individuals may experience cold water shock. Cold water shock refers to "local cooling causing decrements in physical and mental performance, and ultimately core cooling as hypothermia occurs" (Giesbrecht, 2000, p. 733). Seafarer occupations then are among the most dangerous, impacted by the possibility of ship abandonment and persons overboard, who die from cold water immersion and thus drowning (Borovnik, 2011; Hudson & Conway, 2004; Sampson & Thomas, 2003; Shan & Lippel, 2019).

The enemies of survival then are not just drowning but also hypothermia. Hypothermia refers to the core body temperature dropping below 35 degrees Celsius (Marx, Hockberger, & Walls, 2002). Hypothermia can play a protective role in survival for near-drowning individuals when in water below or at 20 degrees Celsius (i.e., cold water) by activating the "mammalian dive reflex" thus slowing respiratory and brain activity (Marx et al., 2002), which lengthens the time in which cardiopulmonary resuscitation can be provided. On the flipside, hypothermia leads to accelerated muscle fatigue, arrhythmia (in extreme situations), decreased cognitive activity and, in time, cardiac arrest (Keatinge, 2000). Immersion suits, or appropriate survival gear, can help individuals' stay afloat, and retain heat, which will assist with preventing hypothermia (Department of Transport (Canada, 2003.). Simply said, "properly fitted immersion suits have been associated with improved outcomes after immersion in cold water" (Centers for Disease Control and Prevention, 2003; Hudeon & Conway, 2004, p. 358). In essence, immersion suits (also referred to as constant wear, or abandonment suits, etc.) are considered essential for minimizing heat loss (see Zhang & Song, 2014 for a review on immerison suits). For instance, an IMO certified insulated immersion suit is thought to minimize cold shock response and minimize a drop in deep body temperature (Power, Simões Ré, Barwood, Tikuisis, & Tipton, 2015). Without such a suit, a human can experience hypothermia after 30 minutes of immersion in cold water (Tipton, 2003; Tipton, Collier, Massey, Corbett, & Harper, 2017).

Hudson and Conway (2004) in a retrospective study, drawing on data from the Alaska Occupational Surveillance System (AOISS), analyzed all records of deaths from hypothermia or drowning among commercial fishermen in Alaska between 1990 and 2002. They found that of the 228 deaths caused by cold-water immersion (and the resultant drowning), 19 deaths were seafarers who were wearing immersion suits versus 120

deaths of seafarers not wearing immersion suits. Of survivors in the Alaska study, 36 were wearing immersion suits versus only 17 who were wearing none (Hudson & Conway, 2004). Thus, there is a clear lifesaving capability to an immersion suit. The challenge however that we have found, as women, if on ship our potential for survival is compromised by the ill-fitting suit (e.g., we were drenched). Thus, the impetus for our study is a reflection what needs to be done to make ship abandonment safety for women seafarers (and likely many men, children, etc.).

3. Context: The OSSC and STCW-95.

At the Offshore Safety and Survival Centre (OSSC), part of the Fisheries and Marine Institute at Memorial University of Newfoundland, instructors train individuals in the necessary emergency response skills required to work at sea. The OSSC first opened in the early 80s. The Centre offers a "comprehensive range of safety and emergency response training courses to the offshore petroleum, marine transportation, fishing and land based industries" (https://www.mi.mun.ca/departments/offshoresafetyandsurvivalcentre/, O4/22/2022, np). Equipment at the facilities are versatile, ranging from a survival tank (with a helicopter underwater escape trainer (HUET)), propane fire fields, lifeboats, seagoing marine training vessel, fast rescue craft launching devices, to a virtual helicopter cabin simulator. Many courses are offered at the OSSC, however, our ethnographic experience is drawn from completing the Standards of Training, Certification and Watchkeeping for Seafarers (STCW-95). The completion of the course results in certification by Transport Canada to enable one to work at sea. The course also meets IMO requirements the IMO being an organization of the United Nations mandates training for seafarers. The STCW-95 course accommodates the Canadian regulations from Transport Canada (i.e., domestic vessels safety course). The OSSC also offers courses in Proficiency in Survival Craft and Advanced Fire Fighting. Our focus here is on our experience with the immersion suits and the implications for the safety and survival of women at sea.

4. Current Study.

The current study is both autoethnographic and ethnographic in nature. We unpack our experiences, although years apart, of safety and survival training at the OSSC as women. We look at what could be a universal challenge with fatal consequences for women the ill-fitting survival and safety equipment. We draw from our own experience in a survival tank as women who are both small in stature but different in body size, but both experienced significant and undeniable complications with the fit of our survival and safety gear. We speak to experiences in an immersion suit in a survival tank, and the liability of the equipment. We theoretically underpin our analysis with the understanding of the additional emotional labour that ill-fitting equipment requires the nagging knowledge that one would not survive in an emergency for no reason other than the equipment fails. Thus, for women, in reality, when they meet a trying disaster situation their opportunities for rescue alive, thus survival, is more likely to be compromised by their equipment. For instance, if water seeps into an immersion suit, how can that person survive for long in a ship abandonment in cold water at sea? Having that knowledge, that the suit does not fit, creates additional stress, and the awareness that survival is not as likely. In the case of a disaster at sea, women are then more likely the first causalities. This is entirely problematic in a profession increasingly trying to recruit women (Kitada, 2021; Zhao et al., 2017).

5. Methods.

When conducting any study, how one experiences an event, process, or lived reality can provide foundational information a vital source of insight and opportunities for inquiry, specifically when pursuing the rigorous analyses of the self against the framework of vast and diverse cultural experiences. This is alongside the emotional regulation and balance that accompanies any experience specifically, here we reflect on the emotional elements of the survival training. We reflect on the additional emotional burden that results from ill-fitting equipment and how such equipment creates a new form of emotional labour (Hochschild, 1983) that creates pressures to navigate and manage equipment that fails to fit, thus creating new challenges during a disaster situation. We recognize these challenges cannot be overcome by sheer will, instead they, in a true emergency situation (e.g., abandoning ship) could result in death. Here, arises an autoethnographic component where, consistent with the approach, we seek to understand the empirical realities and truth that shape master and grand narratives in our case, that of safety and survival (Lyotard, 1984). Autoethnographic inquiry provides a framework for reflection and analysis of lived experiences. Although some autoethnographers explore events that changed their lives (Zaner, 2004), or "times of existential crises that forced a person to attend to and analyze lived experience" (Ellis et al., 2011 p. 275) our focus is on what precedes a potentially life changing incident. Specifically survival training, with the recognition that the equipment is challenging and would then limit, in the case of an actual emergency, survival capabilities.

Johnston (2020, p. 138) put forth "By accommodating and recognizing the impact that degrees of subjectivity, emotionality, and evocative personal experiences have on the research process (Harding, 2004), autoethnography can deepen our concerns for social justice and empathies for marginalized populations (Ellis & Bochner, 2000)." If women in maritime industries are a marginalized population is beyond the scope of the current article, but there are social justice needs women in the industry face. Simply said, how can the number of women in the seafarer industries increase, if in the event of a disaster, the occupation is a nearly guaranteed death sentence due to equipment shortcomings? In this sense, there are social justice needs, the fact that equipment does not fit women universally supports their marginalization in the industry.

Through sharing and reflecting on our experiences of the course, we connected based on our shared experiences and together reflectively explored the similarities in our experiences

that were unexpected, recognizing that forward policies must be gender inclusive. Seafarers are first responders (Ricciardelli, forthcoming), on ship, each member of the crew has a predesignated role in the event of a disaster or emergency. Each crew member is responsible for their own personal safety and survival, as well as that of the crew and any civilian on board. However, here, we reflect on how, for example with immersion in cold water, the equipment impairs the survival capacities of women. We also speak to our experiences of, for example, the gloves, and what that means for women in the industry. We ask, should it not be necessary that equipment fit women as well as men, etc.?

We use an phenomenological lens, reflecting on our lived experiences when undergoing the training, trying to come to terms with the tension between equipment fit, training, and survival-creating a new appreciation for what it means for a woman to enter the male dominated profession and with the limitations construed by the equipment (Rennels & Purnell, 2017). The 'phenomenon' we study is the fit of equipment across the six-day course, here we sought to understand the essences, emotions, messaging, changing cultural understanding, lived experiences, and positioning of safety and survival for women at sea. We kept central our own positioning recognizing the social context and how as researchers we were not dependent on seafaring for livelihood (Pitard, 2019). Within this space, we "question taken-for-granted ideas, assumptions, and presuppositions veiling a phenomenon" (Allen-Collinson, Vaittinen, Jennings, & Owton, 2018) to draw truths about how women experience equipment.

Autoethnographically, we employ an analytical approach although our evocative insights were also pronounced and unavoidable due to fears, anxieties, and emotions (Ellis & Bochner, 2000). We question the positioning of women in the industry, and society more broadly, looking at societal powers and how each ensues to create limitations around the role of women as seafarers, looking at relationships and truths such as women marginality in these relationships as per analytical autoethnography (Anderson, 2006). Simultaneously, we aimed to create new ways of understanding about what it fundamentally means to be a woman at sea where equipment is ill fitting and void of basic safety features.

Our data for the study include field notes and experiences, notes from class and reflectivity on the practicum elements all constituted over the six-day course which one author completed in 2022 and the other years prior. We looked for similarities in our experiences in each practicum activity, which constituted a living emergent theme. One author wrote in "real time" as the course was being completed, the other reflected back their experience years prior. Our experiences also occurred alongside a group of persons also completing the course, which provided space for participant observation. We were a type of insider we required certification thus, not simply trusted outsiders (Davies & Francis, 2018). We, however, never felt like insiders as we maintained the position of researcher like others in our course who were also researchers. The course is required for going to sea even for research purposes, thus, for example, Ricciardelli's course included an instructor and doctoral student as well as seafarers working on boats.

Davies and Francis (2018, p. 351) argue "true participation is fraught with epistemological and methodological challenges and is consequently quite rare". We were privileged by our opportunity for full participation, occupying roles in the social group where we could interpret actions of the collective and the collective interpreted our actions, together constituting the broader field of study with complete immersion. We did not go "native", instead we were also students completing the course for certification we had to pass the practical and written exams, the former by completely participating in all activities and the latter by scoring at least 70 percent on the written final. Thus, we were "complete participants", not simply "participants as observers", "observers as participants" or engaged in "complete observation" (Gold, 1958). The ethical considerations in our studies were in the balance of the research and participant role, as we respected the privacy and confidentiality of all that was observed. As such, we carefully preserve anonymity in our writing by refraining from identifying any instructor or participant.

6. Results.

The course, STCW-95 BS, is required to work on any vessel and proceeds through basic safety training tied to survival and proficiency in equipment and processes to remain safe aboard a ship. The areas of proficiency core, required to meet the IMO standards, to the course are personal survival techniques, fire prevention and firefighting, and personal safety and social responsibilities. The course aims to ensure participants are able to identify dangers at sea (e.g., human, natural, mechanical), raise alarms and respond to associated emergencies, minimize the risk of fire, to maintain a state of readiness, to fight fires on a vessel, abandon a vessel and to survive in a marine environment, and take part in rescue operations. To do so, to be proficient in these areas, students require training in using the survival and safety equipment. The expectation is that the equipment will fit, be functional, usable, and support the survival of the bearer. However, what our experiences clarified is that this is not the case for all.

To assist with cold water immersion, we learned to "always get out of the water if you can", the Heat Escape Lessening Position (HELP) which can extend one's survival time by 50%, not to swim (save energy), and to huddle with others during abandonment. We learned the needs for survival (hydration, energy, heat balance) and the signs of hypothermia (e.g., violent shivering, blue-grey skin, bluish lips). We also learned basic treatment for hypothermia, the need for psychological strength and effective leadership. We discussed survival packs and their components and the three stages of marine abandonment: evacuation (clearing the ship without harm), survival (time since abandonment), and rescue.

In the following results, we discuss the practical components of training and our experiences as women biologically in terms of how our size, figures, and stature was negatively impacting the fit of the equipment. We discuss the drawback of "small" and "universal" sizing and explain how we experienced

our equipment in safety and survival training, recognizing, in a real emergency, our chances of survival would be considerably lower by no fault of our own as a result of the compromised equipment that is clearly not designed for women. We start with a discussion of experiences in the survival tank, wearing immersion suits that did not keep us dry, the large gloves and boots, and oversized length of suits and the impairments each perpetuates. We reflect on the resultant emotional labour the added stress of navigating the ill-fitting equipment and then conclude by speaking to the need to remedy such challenges as more women are entering the field of mariners, and these women deserve to have a fair chance of survival in an adverse event.

6.1. Immersion Equipment: Surviving Ship Abandonment.

In class we learned that the factors affecting survival include psychological factors (Barwood et al., 2018). However, psychological factors can become detrimental with the additional burden of knowing the immersion suit does not fit it is another layer of stress and concern, unprecedented and unnecessary given the very real possibility of ship abandonment. Other factors, we learned, include age, physical condition, fitness (body fat), knowledge, underlying clothing, buoyancy apparatus, and having a survival craft. Cold water shock can be the end to life (or drowning when water enters the lungs).

In our practicum, we sat on the deck of the survival tank with an immersion suit. Reiterated to us all is that the key to survival in cold water is not simply a life vest, it is a survival/immersion suit. In essence, one wants to abandon the ship dry and stay dry as the most significant risk to life is simply "getting to the life raft" that time between ship abandonment and life raft entrance. Ideally, one wants to board the life raft dry, but staying dry is not easy to do during adverse weather events (or more generally).

For Ricciardelli, feeling ready and trained, keen to stay dry, I dawned my immersion suit, my first thought being very simply is this really going to keep me dry? But I trusted in the suit and what I had learned. As a petite woman, my height just over five feet and my statue quite small, I was truly "swimming" in the "small" sized suit. The opening around the face was loose in comparison to what appeared to be the fit of my peers (where it was like spandex against their face), the legs much too long (I was pulling them up to keep my feet in the actual feet of the suit), and the air in the suit rather uncomfortable (multiple times I swished the suit against my body to remove air). I wrapped the bands around the gloves tightly to keep out water as instructed and trusted in the suit as I was to enter the cold water, dreading the experience as I despise being wet and cold. Upon immersion, as my legs submerged as I descended the ladder, I felt the coldness of water but the layer of protected over my legs was welcoming. However, as I left the ladder and fully submerged in the water I felt the chill of cold water penetrating in full effect. Within minutes my clothing under the suit were completely wet and with every movement water seeped in through the opening of the suit around my face there was so much water I was sure there was a hole in the suit. By the time I exited the tank, after only about 15 minutes of exercises, I had water up past my knees to my thighs locked into the immersion suit. I was standing in cold water. I was completely wet, cold, and not at all protected from the elements.

We had learned in class that one liter of water reduces heat 25 percent in a suit. The arms and face have to be tight and Canada has regulations about suits, requiring employers to offer custom suits to those who require them. Again, a deterrent for employing women and an inconvenience for women. Instructors provided ideas about how to improve the fit of the suit (e.g., tape the wrists, purchase a custom fit). My chances for survival would be significantly reduced if this was not a training exercise. I was wet and cold.

It was almost amusing, I would pitch my nose while covering my mouth which prevents one from grasping and inhaling water and thus drowning during ship abandonment my hand placed over my face. The water seeped in through the face opening, I could not feel it enter, given the speed of entry to water, but it was the only way in which water could enter the suit (and clearly not exit the suit since the water remained). The temperature of the water in the survival tank is approximately 20 degrees, not too cold and not going to cause any injury, but cold enough to be truly uncomfortable. It was when we removed the suits, and sat for lecture before reentering the pool, that the coldness of wet clothing overcame me creating a shiver throughout my body that felt incomprehensible but to which I needed to control.

In our second example, Carnahan is also a small woman, just over five feet tall. My experience to wearing the survival suit is similar to that described by Ricciardelli. My challenges began right when I had to zip up the suit. It required a maximum physical exertion to move the heavy zipper, which added to challenge when trying to dawn the suit, particularly in the dark.

When I entered the water, I recall the cold water entering the suit through the neck and the suit filling such that I was cold for the whole training exercise. The water and air pockets inside the suit affected my buoyancy as well made maneuvering in the water to change positions a bit more challenging. The suit has filled to such an extent that when I climbed onto the deck after the exercise I was unable to walk because there was so much water in the legs of my suit. I had to lie on my stomach and raise my legs to get the water to drain out of the neck, exemplifying just how unsafe the suit appears to be.

6.2. Beyond being wet: The fit of the suit.

As we continued the training, I Ricciardelli struggled with the oversize three fingered gloves as I tried to hold onto the ladder (while also trying to pull up the water filled pant legs to fit my feet into the feet of the suit, which was necessary to place my feet on the ladder rungs). Said differently, beyond the wetness, was the awkwardness of the gloves. The "three finger" glove was designed for a person of larger stature. Even in the small suit, the extension of the gloves for imaginary larger hands impaired my ability to hold tight to the ladder, the energy that I exerted to climb up and down the ladder was unfair in comparison to others whose equipment fit appropriately. The emotional labour increased tremendously anxiety about finding

a grip more than learning a skill. My other concern was finding footing, as the legs of the suit made keeping my feet in the "feet" near impossible, and I climbed up and down, I need to adjust the pant legs, pulling them up, to ensure that my feet were on each rung (which meant only holding with one hand in an ill-fitting glove). In adverse conditions, my ability to survive would be impaired, by no fault of my own simply because of my stature. I was battling the extra weight of water, the buoyancy of additional air, the cold, and the ill-filling suit. My ability to use my hands and feet lessened.

My strength compromised by the ill fit, as I tried to grasp the ladder or life raft, my feet and legs fighting extra fabric instead of being supported by a suit. In all exercises, I felt compromised by the suit. I had the added weight of water to counter as I stepped into the water, both at a meter and at three meters. The additional weight pulled me down harder, and I had to drain the air from my suit prior to stepping a process of taking a knee and flattening out the suit to not flip forward due to air and exit the water breech. My abilities and movements compromised, which would only be a recipe for disaster in the event of a real ship abandonment.

The large size of the feet in the suit was also a barrier for me (Carnahan). When climbing the scramble-net I was able to maneuver with my upper body as I chose to hook the rope with my whole arm rather than even attempt to grasp with the oversized gloves. However, my lower body was very difficult to manage because not only were the legs of the suit filled with water which weighed me down, the feet were very oversized and it was difficult to manage a secure foot placement on the rope as I climbed.

Finally, when jumping into the water from a 10 meter height it is advised to remove the air from your suit prior to the jump. With my oversized suit I was unable to expel all the air and when I jumped from height I was presented with a blast of air that blows water in your face and up the nose. Not very pleasant.

Discussion and Conclusions.

For both of us, the suits were too large and, as a result, we were completely wet and cold. We wore the smallest size available. The fact that there are only three sizes for adults is concerning. Moreover, our struggles with the hands and feet were shared, they compromised our ability to hold and climb the ladder, to name a few of the barriers the largeness created to safe ship abandonment and rescue. Hypothermia, which must have a prevalence if the immersion suit is ill-fitting; a suit that allows enough water in that you are entirely wet and in water is very cold in controlled conditions and would be even colder in most situations on northern waters. Undeniably, designers and producers of survival and safety equipment need to recognize a second market that requires customization and development of proper fitting equipment that of women. There is a need for immersion suits that meet the body types and needs of women and incorporates the measurements of women into its constitution and construction. In future research, there is a need for learning where people "get wet" when doing training in immersion suits to be able to make evidence informed, robust recommendations for immersion suit redesign, a necessary redesign tied to improving probability for survival among women and likely all seafarers.

In trying to recruit additional women into the seafarer professions, it is a societal, safety, and occupational and recreational problem that equipment does not fit women, because of the threat to safe ship abandonment. In essence, simply said, this means that when a disaster happens, women are likely the first causalities. Their chances for survival are reduced and injury increased for a problem with a solution. How can it be consciousable that women work in such spaces without the proper equipment, in 2023?

The emotional labour, the degree of stress and concern, that comes from the nagging knowledge that equipment does not fit is an additional burden women at sea but manage. The emotional labour is inverted on to self, inescapable, and reveals the risk women at sea undertake, as the recognition of their ill-fitting equipment is unescapable. There is an emotional difference and element of surprise, which we both experienced, when entering the water in an immersion suit expecting to stay dry and instead experiencing a full-fledge cold water immersion. After that, there is the knowledge that without a custom suit, one will become entire and completely drenched, with water retained inside the suit. There are then, psychological, ethical, and safety reasons, among others, to consider how to better design immersion suits and society works to recruit more women in seafarer occupations, which remain a male-dominated occupation that few women have adopted as their own.

Our study is limited. First, only Ricciardelli conducted an ethnography taking active notes while completing the training. Carnahan reviewed notes from the course from her training and drew from lived experience. Neither of us set out doing the courses to study the fit of the immersion suit. Thus, our findings are complementary, both autoethnographic and lived experience based, but limited methodologically by being emergent. Second, no additional details can be provided about Carnahan's experience. Third, given the number of instructors at the OSSC and the time gap between our completing the course, we cannot be certain if we had the any of the same instructors at any point during the training.

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