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# Evaluation of the Lifejackets for Lobstermen program: A social marketing initiative to increase lifejacket use in the Northeast lobster fishing industry

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ABSTRACT

*Background:* Fatality data from the U.S. commercial fishing industry indicates workers in this industry suffer from comparatively high rates of work-related death, in relation to other U.S. industries. Falls overboard are the most frequent cause of death among Northeast lobster fishermen, who make up a large proportion of the commercial fishing industry in this region. PFDs can be an effective solution for preventing fatalities due to falls overboard and vessel sinkings. This study describes the implementation and impact of an intervention focused on increasing PFD use among lobster fishermen in MA and ME.

*Methods:* The intervention, entitled "Lifejackets for Lobstermen", utilized social marketing principles to make PFDs an appealing and accessible option for lobster fishermen. This included offering a variety of fishermen-approved PFDs, as well as making access to these PFDs easy and affordable by bringing them to ports and offering 50% discounts. The program was also promoted widely using slogans and pictures that connected PFD use to fishermens' values and interests. Intervention impact was measured using pre and post intervention surveys measuring changes in fishermens' readiness to wear PFDs and through intervention PFD sales.

*Results:* Survey data indicate a significant shift in readiness to wear PFDs in the ME and MA lobster fishing industry in both the treatment and control regions of the study. The largest shifts occurred among fishermen who had not considered wearing PFDs previously. However, during the study assessment period, 88% of intervention PFD sales came from fishermen in the treatment region.

*Conclusions:* The application of social marketing principles to increase the use of PFDs among lobster fishermen in MA and ME successfully increased fishermen's willingness to consider and purchase PFDs on fishing vessels.

## 1. Introduction

Worldwide, commercial fishing is known to be a very dangerous occupation, with 24,000 fatalities reported annually.(The state of world fisheries and aquaculture, 2014) In the US, the commercial fishing industry's fatality rate is 28.5 times higher than that of all workers, with 99.8 deaths per 100,000 workers for fishing, compared to 3.5 deaths per 100,000 workers for all industries. (Civilian occupations with high fatal work injury rates, 2017) Information collected from the National Institute of Occupational Safety and Health (NIOSH) Commercial Fishing Incident Database (CFID) captures detailed information on the circumstances surrounding commercial fishing fatalities. Data from this surveillance system indicates vessel sinkings are responsible for the greatest proportion of fishing fatalities, while falls overboard are the second most frequent contributor to work-related death in this industry. (Case et al., 2018) Vessel sinkings were also found to be primary contributors to occupationally related mortality rates among commercial fishermen in Denmark and Iceland. (Petursdottir et al., 2007)

Case reports, which are included in the CFID database, provide valuable information on the circumstances surrounding fatal falls overboard. According to CFID records, of the 121 fatal falls overboard that were documented from 2000 to 2016, almost 60% were not witnessed and nearly all victims (89.3%) were never found. Regional comparisons indicate that Alaska's fishing industry reports the highest number of fatalities (133 from 2000 to 2009), followed by the Northeast at 124 and the Gulf of Mexico at 116. (Lincoln and Lucas, 2010)

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In response to the significantly high fatality rates in this industry, the Centers for Disease Control published a 2010 report in MMWR calling for efforts to reduce fatalities and develop "prevention measures tailored to specific high-risk fisheries…focusing on prevention of vessel disasters and falls overboard." (Commercial fishing deaths - United States, 2010) Looking specifically at high-risk fisheries on the East Coast, lobster fishermen experience the highest number of deaths of any of the eastern commercial fishery sectors, while falls overboard are the most frequent cause of death among this group. (Commercial Fishing Safety on the East Coast NIOSH)

Although preventing vessel disasters and falls overboard would be ideal targets for fatality prevention efforts, factors contributing to these events are myriad and complex, which makes tailored approaches for these issues challenging. For example, wind speed, weather, age of the vessel, distance from shore and season, all appear to contribute to the probability of vessel sinking. (Lucas et al., 2018) Falls overboard can occur as a result of setting gear, hauling gear and handling gear, while some occur on deck while crew members are off duty (22.4%).(Case et al., 2018) Fatality reports from assessments of falls overboard in U.S. fishing between 2000 and 2016 indicated that none of the victims were wearing a personal flotation device (PFD) and rescue attempts most often failed. Thus, the diverse factors contributing to falls overboard and the broad utility of PFDs in improving rescue outcomes, has made the development of interventions to increase PFD use in the commercial fishing industry an occupational health priority.

Unfortunately, no prior, published studies have attempted to assess the prevalence of PFD use in the Northeast commercial lobster fishing industry. However, a qualitative study conducted with lobster fishermen in Maine and Massachusetts found that they experience numerous barriers to using PFDs and many described a long-standing tradition of not using them while working on fishing vessels. (Weil et al., 2016) Stated barriers included difficulty working in a PFD, the social stigma of using a PFD and a tendency for fishermen to downplay risks. (Weil et al., 2016) Similar observations regarding perceptions of occupational risk and penchant for risk-taking behaviors have been identified in traditional fishermen in Morocco. (Laraqui et al., 2017) However, other studies exploring the question of safety culture on fishing vessels have identified variation in safety attitudes based on age group, vessel type and familial connections to fishing (Håvold, 2010) or calculated risk-taking based on predicted revenue. (Jin and Thunberg, 2010) Studies regarding fishermens' attitudes toward safety regulations have also indicated opposition to regulations requiring the use of PFDs. (Weil et al., 2016; Thorvaldsen, 2013) In particular, one study conducted with Norwegian coastal fishermen demonstrated that fishermen employ a number of strategies such as "common sense", cooperation and institutional knowledge, which they believe eliminates the need for regulation. (Thorvaldsen, 2013) Thus fishermens' attitudes towards risk and regulation, as well as complications with monitoring the use of lifejackets, in particular, on board a vessel at sea, make a regulatory strategy for increasing PFD use largely impractical.

*A Social Marketing Initiative to Promote Safety Performance:* In response to this need, researchers at the Northeast Center for Occupational Health and Safety: Agriculture, Forestry and Fishing (NEC) sought to trial a non-regulatory strategy for encouraging lifejacket use. Social marketing was selected as the studies interventional framework as it has proven remarkably successful in addressing behavior change issues (Firestone et al., 2017; Pirani and Reizes, 2005) in the arena of public health. For example, it has been used to tackle issues such as childhood obesity (Lambrinou et al., 2020), HIV testing (McDaid et al., 2019) and encouraging healthy lifestyles. (Tarro et al., 2019) It is also a strategy that is ideally aligned with behavior change issues that have been resistant to change, as it attempts to remove barriers and increase motivators in ways that favor healthier and safer decisions. (Nancy Lee, 2011)

Over the past four years, NEC researchers have partnered with fishermen, fishing organizations, manufacturers and governmental organizations to implement a social marketing intervention aimed at increasing PFD use in the lobster fishing industry. These efforts have included trials of PFD designs with lobster fishermen, (Sorensen et al., 2019) expansion of distribution opportunities via the creation of lifejacket vans traveling from port to port, expansive promotion of these efforts and intensive community collaboration. This paper provides an overview of the impact of the program on lobster fishermens' interest in using PFDs and the purchase of PFD options through the program.

## 2. Methods

Theoretical Framework: As mentioned in the Introduction, the research team choose to utilize a social marketing approach to increasing lifejacket use among lobster fishermen in Massachusetts and Maine. Social marketing requires considerable investments in understanding the behavior change issue from the target population's perspective so that the "choice environment" can be altered to favor healthier or safer behaviors. (Grier and Bryant, 2005; Smith, 2006; Arcaro et al., 2013) This involves prolonged engagement with the target population to understand their relationship with the behavioral issue (in this case lifejacket use). (Andreasen, 1995) Engagement can include conducting interviews, attending community meetings and embedding partners and members of the target population in the solution development process. It also requires gathering continued feedback from the target population in the development process to ensure solutions are "on-track". Lastly, solutions are designed to be broad and multi-faceted, which in the parlance of social marketers, means attending to the Four-Ps (Price, Product, Place and Promotion). (Suarez-Almazor, 2011) These Four P factors, force intervention developers to look at all aspects of the behavior change process, including lowering the price one pays for engaging in the behavior, making the product (or intervention) attractive to the end-user, making it easy to gain access or interact with the intervention and targeted / tailored promotion of the intervention. (Andreasen, 1995; Kotler and Lee, 2008) Stages of Change theory has also often been used to evaluate and strengthen social marketing campaigns and as such, was used as a means of measuring outcomes for this study. (Arcaro et al., 2013)

Intervention Description. Development of the "Lifejackets for Lobstermen" social marketing intervention involved several phases of data collection, analysis and program development. Throughout this process lobster fishermen from both Massachusetts and Maine were integrally involved in all aspects of the research, which took three years to complete. In the first year, lobster fishermen were asked to trial PFDs and to identify various designs that addressed previously described barriers to use. This included restricted range of motion, discomfort and concerns of PFDs getting caught in fishing gear. (Thorvaldsen, 2013) One hundred and eighty one fishermen agreed to participate in two, four-week trials of PFDs, which were held in the winter and summer. Trials demonstrated that PFD preferences were highly varied and that fishermen preferred to have a range of options (e.g. different types of flotation, configurations and materials).

Once viable PFD options were identified, the research team queried the lobster fishing community and audited commercial marine suppliers to search for supply chain issues that could potentially limit access to more desirable designs. Results indicated that commercial marine suppliers stocked a limited array of PFD designs, largely due to the minimal interest from the fishing community in purchasing PFDs.

In order to address supply chain issues and offer a wider-range of preferred PFD options, researchers acquired stocks of desirable PFD designs from national and international suppliers and outfitted two large vans with the devices. The program, dubbed "Lifejackets for Lobstermen" allowed researchers to bring a wide selection of PFDs directly to the docks for the lobster fishermen to make side-by-side comparisons and to purchase any options they liked. The fishermen also received information about the PFD designs, such as inherent, manual, automatic or hybrid flotation, the pros and cons of different designs and videos

showing their use "in action". Fishermen visiting the van also received a 50% discount on all PFDs.

The resulting social marketing campaign was thus designed around the four Ps of social marketing, which are defined for this study as:

**Promotion:** Targeted social marketing messages and earned media reports distributed through traditional platforms such as association newsletters and local newspapers, as well as on social media.

**Product:** PFDs that were trialed in initial phases of the study and were later sold at the Lifejackets for Lobstermen van.

**Price:** PFDs were offered at a 50% discount.

**Place:** PFDs were brought to lobstermen at the docks for easy access.

In order to facilitate a rigorous evaluation of the Lifejackets for Lobstermen intervention, ports in Massachusetts and Maine were divided into treatment and control ports. Treatment ports received a visit from the Lifejackets for Lobstermen vans from April 1, 2019 to October 23, 2019. Promotion for the project was vast and included coverage in industry magazines, TV stations, fishing associations, on social media, and radio stations. Researchers also developed and tested tailored promotional materials featuring concepts that most resonated with fishermen. These were featured in posters, social media posts, and print ads. Since promotional activities could not be restricted to treatment ports, the treatment and control groups were both exposed to this component of the intervention. Following the initial visits to treatment ports, the fishing community requested access to the Lifejackets for Lobstermen program in control ports. In response, the Lifejackets for Lobstermen vans visited select control ports from October 25, 2019 to November 18, 2019 after post-intervention surveys had already been completed.

Measuring Intervention Impact: Stages of Change Surveys and Sales Data. The impact of the Lifejackets for Lobstermen project was measured in two ways. The first measure of impact came from PFD sales data captured in the Lifejackets for Lobstermen retail Salesforce database. (Prochaska and Velicer, 1997) The second involved a survey containing a series of questions developed to classify each survey participant along a "Stage of Change" continuum. These "Stages of Change" (SOC) questions were based on the Transtheoretical Model (Sorensen et al., 2011), which posits that behavior change takes place in a series of proscribed steps (i.e. pre-contemplation, contemplation, decision/determination, action, and maintenance). SOC survey questions were designed to both classify lobster fishing Captains' disposition towards their own PFD use as well as their interest in creating a PFD policy for their crew. In addition, the Captains were asked to provide demographic details, information about their boat (open or close transom etc.), and details of their fishing practices (distance from shore, etc).

SOC Survey Participant Recruitment. For Maine, the sampling frame for the SOC survey was taken from a list of commercial lobstering license holders obtained from the Maine Department of Marine Resources. The Massachusetts sampling frame came from a comparable list of commercial lobstering license holders provided by the Massachusetts Division of Marine Fisheries via the Massachusetts Lobstermen's Association. A random sample was drawn from each list, study information was mailed to each individual and a telephone protocol of seven-contact attempts was used for recruitment (three afternoon, three evening, and one weekend call). Verbal consent for participating in the survey was obtained at the time of the call.

To be eligible for the study, the subject needed to be at least 18 years of age, planning to set and haul traps within the twelve months following the survey and anticipating fishing for at least the next two years. The survey was only administered to the license holder of the fishing vessel. Subjects received two $20 Amazon gift cards for completing the baseline and post-intervention surveys. All participants completing both the pre and post-intervention surveys were entered into a drawing to receive one of four $500 Visa gift cards and a LifeSling3 Overboard Rescue System (USCG approved Type V) valued at $400, for a total value of $900.

Control and Treatment Regions. Assignment of subjects to control and intervention status posed several unique challenges. Initially, the idea of assigning one of the two states (Maine and Massachusetts) to the intervention and the other to control was considered, but this idea was abandoned due to concerns over the potential for negative reactions from lobster fishermen in the control state. As a result, both Maine and Massachusetts were divided into three intervention and three control areas. The assignment of treatment and control ports was also conducted in a manner that ensured all 262 subjects were distributed evenly between the two experimental conditions (treatment and control). This resulted in 138 of the pre-intervention subjects from 50 ports being assigned to treatment areas and the remaining 124 subjects from 59 ports to control regions.

Data Analysis. For both pre and post conditions, each Captain was classified into one of six levels of stage of change (SOC) based on their responses to SOC survey questions regarding their own PFD use and their consideration of a PFD policy for crew members. These stages are organized along a continuum and in order to facilitate data analysis, each stage was converted into an ordinal variable as follows:

***1*** = ***Maintenance*** *W*earing PFD 100% of the time when on deck.
***2*** = ***Action*** Wearing PFD more frequently than in the past 6 months;
***3*** = ***Preparation*** Planning to wear a PFD more than in the past 6 months.
***4*** = ***Contemplation*** Considering wearing a PFD more frequently than in the past 6 months
***5*** = ***Pre-Contemplation (motivation issue)*** Believes using a PFD is important, but not using one
***6*** = ***Pre-Contemplation (knowledge issue)*** Believes using a PFD is unimportant, not using one

All SOC scores were summarized as frequencies and stratified by pre and post conditions for treatment and control groups. The percent of time wearing a PFD while fishing and the pre-to-post change in PFD use were also summarized as medians and interquartile ranges due to the high degree of right skew in the distributions of these variables. The pre-to-post change in the percent of time wearing a PFD was compared between treatment and control groups for both the Captain and crew using Student's *t*-test. Finally, the significance of the baseline-to-follow-up changes in percent PFD use and SOC were analyzed using the Wilcoxon Signed-Ranks test. The study was approved by the Mary Imogene Bassett Institutional Review Board [IRB Approval Reference #2038].

## 3. Results

For the SOC survey, the pre-intervention response rate was 47.5% and 83.3% for the post-intervention survey. Respondents were primarily male (98.6%) and the average age of respondents was 54.4 years (sd ± 13.9). Average years fishing for survey respondents was 32.7 (sd ± 15.1), while respondents responses to distance fishing from shore showed strong right skew with a median of 3 miles (IQR 3–10). Average crew size among the 79.6% respondents who reported fishing with a crew, was 1.3 (sd ± 0.5).

Analysis of survey data indicated no significant treatment versus control differences in the key study endpoints. This was true for pre to post-intervention changes in the Captains' SOC score (Captains in the treatment group had an average increase of slightly less than one SOC level (0.78), while controls exhibited a similar increase (0.69), $p = .65$). Findings were similar for the Captains' crew policy for PFD use (the treatment group exhibited an SOC increase of 0.74, while the control demonstrated an SOC increase of 0.66, $p = .72$). Pre to post-intervention changes in the percent of time Captains were using a PFD were also similar for treatment and control groups. Captains in the treatment group indicated they had increased their use of PFDs while on deck by 6.0%, while control group Captains stated they had increased their use of PFDs by 4.3%, $p = .50$. Changes in the percent of time using a PFD while on deck for crewmembers was actually slightly higher in the

control vs. the treatment group (treatment = 1.3%, control = 5.2%, p = .06).

In addition to these measures, data was analyzed to further understand which subjects were most impacted by the intervention based on the participant's baseline SOC. For example, as shown in Fig. 1, participants in the treatment group who started at the pre-contemplation knowledge stage had an average increase of 1.5 stages. Results from these analyses indicate that the change in SOC from baseline to post-intervention was inversely related to the Captains' baseline SOC level. In other words, individuals originally classified in the primary stages of change (pre-contemplation knowledge and pre-contemplation motivation) exhibited the largest shifts in SOC, following the intervention. This was true both for the Captains' SOC ($r = -0.34$, $p < .0001$) and for the Captains' SOC in creating a PFD policy for crewmembers ($r = -0.29$, $p = .0002$). (See Figs.1 and 2).

Given the relatively similar pre-to-post intervention changes in SOC between the treatment and control groups, the data from both groups was combined. Overall, there were statistically significant changes in both SOC and PFD use for combined groups. The Captains' reported percent of time on deck using a PFD increased significantly (1.3% versus 6.5%, $p < .0001$), as did the Captains' reported use of PFDs by crewmembers (1.6% versus 4.8%, $p < .0001$). The Captains' average change in SOC (2.3 versus 3.0, $p < .0001$), and the Captains' SOC with regard to a PFD policy for his crew also shifted significantly from pre to post-intervention (2.2 versus 2.9, $p < .0001$). Pre to post-intervention shifts in the Captain's percent of PFD use on deck showed an increase of 5.2% ($p < .0001$) for treatment and control groups combined, while the change for crew PFD use increased by 3.2% ($p < .0001$).

Although the differences were not statistically significant, there was some indication that the change in SOC (0.93 versus 0.69, $p = .34$) and the change in the percent of time wearing a PFD while on deck (8.3% versus 4.5%) was greater among Captains who fished alone. No relationship or trend was seen between the Captains' age or the distance fishing from shore and: 1) the Captains' change in SOC, 2) the Captains' change in SOC with regard to crew policy, 3) the Captains' change in percent of time wearing a PFD, or 4) the change in percent of time crewmembers were wearing a PFD.

In contrast to the similarity of the changes in SOC between treatment and control groups, there were large differences in the actual sales of PFDs from the Lifejackets for Lobstermen van. In total, 1087 PFDs were sold to 559 fishermen between April 1, 2019 through November 18, 2019. Of those 1087 PFDs, 830 were sold to 444 fishermen during the intervention period (April 1, 2019 to October 23, 2019). Three hundred and ninety-two of those fishermen were from treatment ports and 52 were from control. By this point, SOC follow-up surveys had been completed for the study, so project staff chose to bring the vans to control ports in order to offer those fishermen a chance to purchase lifejackets from the van. During this time period (October 25, 2019 –November 18, 2019) 115 fishermen in control ports bought a total of 257 PFDs (with the exception of two fishermen who were from treatment ports).

## 4. Discussion

This study describes a social marketing approach to improving the safety of commercial fishermen. This typically involves combining the "four Ps" of social marketing (promotion, product, place, and price) to motivate and reduce barriers to behavior change – in this case increasing the use of PFDs on commercial lobstering vessels in the northeastern US.

As demonstrated by the results from the pre to post-intervention surveys in our study, it was possible to move fishermen farther along the stage of change continuum in relation to use of PFDs on commercial lobster fishing vessels. However, our results also demonstrated significant shifts along the SOC continuum in both treatment and control groups, which underscores the challenges of using treatment / control research designs in social marketing interventions. As other social marketing studies have demonstrated (Smith et al., 2018; McDaid et al., 2019), it is often difficult to minimize control subjects exposure to promotions, which are an integral component of any social marketing intervention. The results of the pre-/post- SOC survey indicate that control subjects exposure to promotional messages, likely increased their SOC scores, as they did fishermen in treatment ports. Similar associations between message exposure and positive changes in perceptions, attitudes and dispositions towards healthier and safer behaviors have been noted in the literature. (Prochaska, 1995)

In addition to these results, the SOC surveys demonstrated that movement along the Stage of Change continuum was more likely to occur for those fishermen classified in the earlier Stages of Change prior to the intervention launch. This may be an indication that promotion of PFDs and the "Lifejackets for Lobstermen" van was particularly effective in getting pre-contemplators to consider behaviors that they had previously ignored. As stated by the developers of the SOC model, shifting individuals along the change continuum often requires careful attention to the barriers encountered at each particular stage of change. (Storholmen et al., 2012) For pre-contemplators, demonstrating that feasible, fishermen-approved options are available and providing tailored messages that highlight aspects of PFD use that fishermen value is crucial for getting fishermen to even consider their use. Identifying lifejacket designs that are compatible with end-user wants and needs was likewise found to be crucially important in a study conducted with

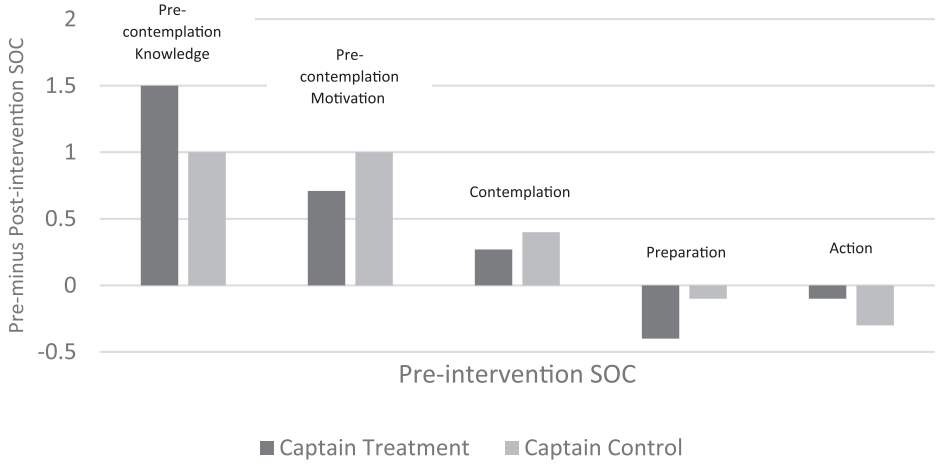


**Fig. 1.** Pre and Post Distribution of SOC for Captains in Treatment and Control Groups. Captain's Shift in SOC Stratifed by Baseline SOC: Treatment and Control Comparisons.

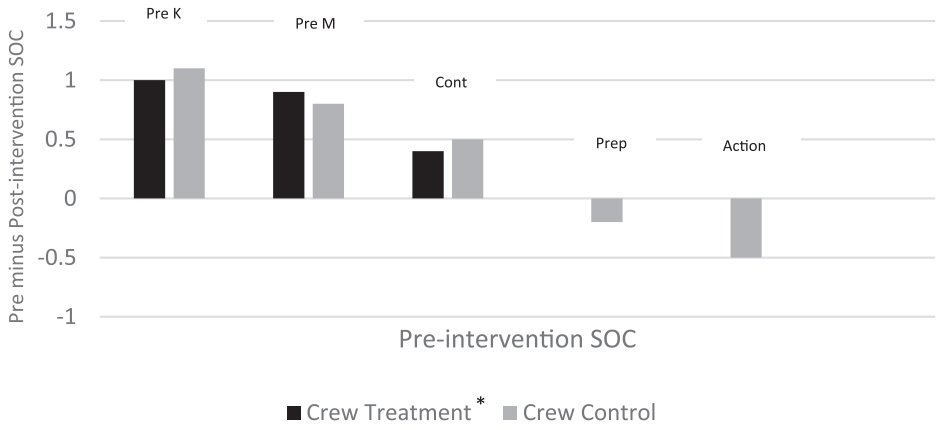


**Fig. 2. Pre and Post Distribution of SOC for Captains in Treatment and Control Groups.** Captain's Shift in SOC on PFD Policy for Crew Members Stratified by Baseline SOC: Treatment and Control Comparisons. *There were no pre to post intervention differences in the mean SOC for a crew PFD policy for Captains who started in the prep and action stages at baseline

fishermen in the Mediterranean and northern fishing grounds. (Lavack et al., 2008) Looking more broadly at the application of social marketing to other occupational health and safety issues, similar observations have been made about the value of developing tailored, multi-faceted, social marketing interventions, particularly for younger workers or drivers. (Shamsi et al., 2016; Smith, 2006) Our results also indicate that PFD promotions were influential for fishermen who fish alone, as these individuals reported a greater increase in SOC scores than other respondents.

Though promotions helped demonstrate an increase in SOC, there was little data from the pre and post-intervention SOC surveys that indicated an increase in PFD purchases or usage among survey participants. However, data from the Lifejackets for Lobstermen van sales, which incorporates all components of the social marketing intervention (Price + Place + Promotion + Product), showed an impressive number of sales and interest (1087 PFDs sold in eight months). While many PFDs provided through the project could have been purchased from online retailers, conversations with lobstermen in the initial phases of the project indicated that they were unlikely to seek out new PFDs, choosing instead to meet only the minimum requirements set by the US Coast Guard (having a USCG approved PFD onboard the vessel, but no requirements for wearing the PFD at all times while working). The large number of PFDs sold at the vans however, suggest that all four social marketing Ps were essential for moving lobstermen into the final stages of the SOC continuum (i.e. Preparation and Action). This suggests that while promotions may be useful for getting fishermen to consider PFD use, the additional Ps (place, product, and price) are important for moving individuals beyond contemplation to action. Other social marketing interventions using a similar, multi-faceted approach to behavior change have demonstrated success, (Levy et al., 2007; Rivara et al., 2012; Sorensen et al., 2008; Sorensen et al., 2017) while some of have demonstrated little change adoption of injury prevention practices. (Althubaiti, 2016) This suggests that social marketing may not be a viable strategy for all injury prevention issues and is likely highly dependent on the issue, the population and other factors.

*Limitations:* While the four Ps of the social marketing campaign are likely to have significantly influenced attitudes and behaviors related to PFD use, other possible influences also exist. First, the project itself naturally led to an increase in discussions about PFDs in the fishing community. This includes earlier phases of the research (such as the baseline SOC survey described here), as well as events in which study staff were present (association meetings, trade shows, PFD trials and intervention message testing). These activities could also have contributed to improved attitudes and behaviors related to PFD use. Additionally, SOC measures by necessity rely on subjects' self-reported and self-assessed changes in attitudes to PFD use. As such, these measures are vulnerable to the biases that are often connected with self-report measures, such as social desirability and recall bias (Althubaiti, 2016).

## 5. Conclusions

The results from our study indicate that social marketing strategies have the potential to increase lobster fishermens' willingness to consider using PFDs while working on vessels. Although methodological issues preclude our ability to definitively contribute increases in readiness to use PFDs to the social marketing intervention, the combined use of surveys and sales data from lifejacket vans appear to indicate progress. In particular, evaluation data demonstrated the positive influence of tailored promotions on fishermens' interest in PFD use, while the combination of promotions and access to fishermen approved, affordable lifejacket options appears to motivate fishermen to move beyond contemplation to taking steps to utilize PFDs while fishing.

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## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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